



A Journey to the Water's Edge: Enhancing the Experience in the Landscape

by
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B.A., University of Washington
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June 1993

submitted to the Department of Architecture in partial fulfillment of the
requirements for the degree Master of Architecture
at the Massachusetts Institute of Technology
February 1996



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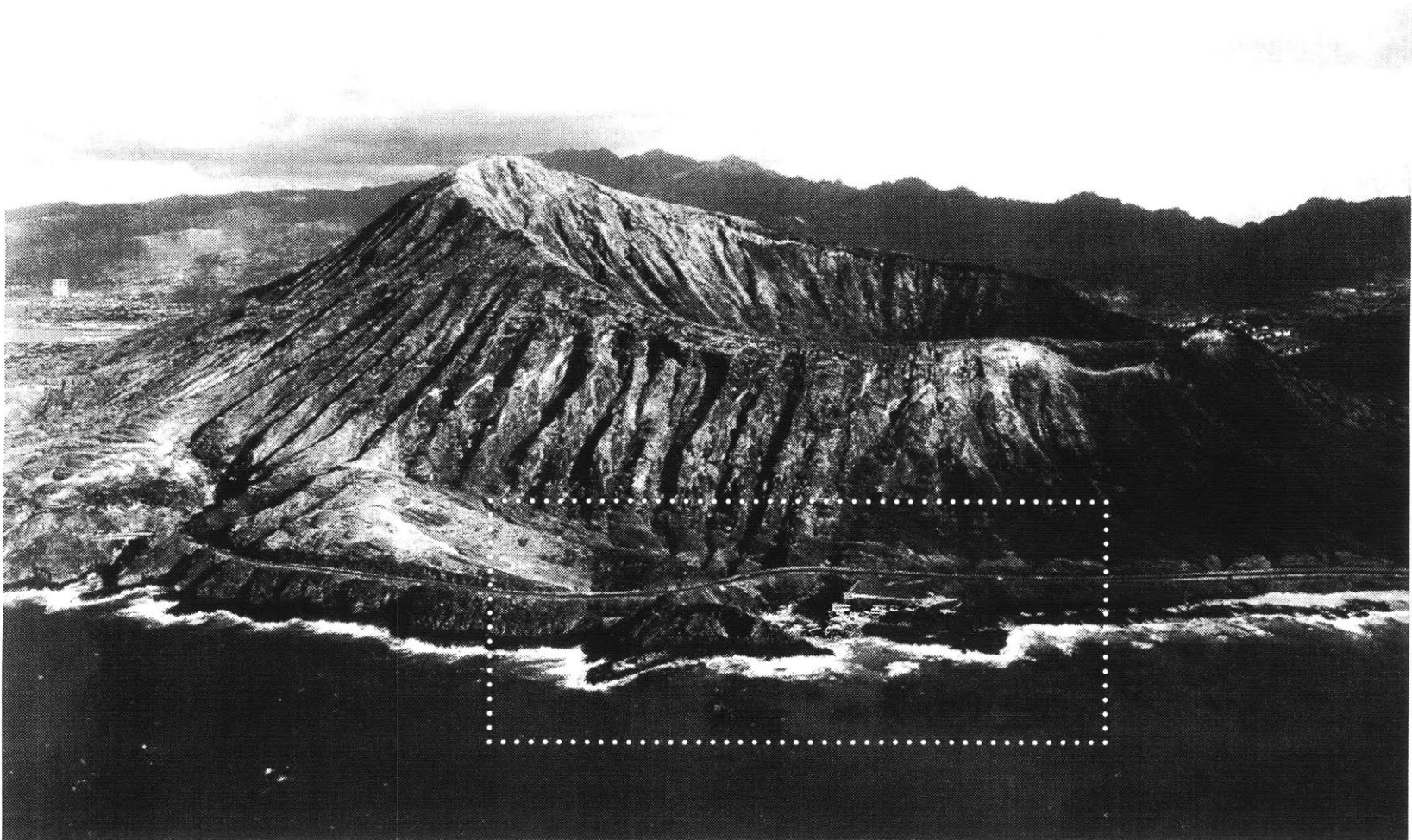
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fig. 3.1 Project site with Koko Crater in the background.

Dedication

To Mom, Dad, and Reid with love.



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Enhancing the Experience in the Landscape

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ABSTRACT

A meandering highway passes through beautiful and diverse landscapes around the island of Oahu, Hawaii. Along the coast, mountains rise up to one side as the ocean extends out to the horizon on the other. The landscape on the southeast portion of Oahu is breathtaking in its barren and eroded land forms. Here, the land is carved into coves, and cliff edges drop dramatically to the water.

The site for this exploration is located along this coastal area at Halona Point. Aside from the highway, the only other built forms are a large parking lot and platforms for viewing the ocean. Presently, there is no strong connection between the parking lot, the cliff, and the cove. The design of a swimming facility on the cliff proposes to enhance the connection by nurturing the intrinsic quality of the landscape, as well as enabling a new experience in the journey down to the water.

This thesis centers around ways of intervening with built architectural form in the existing topography and materials of the site. The design explores different strategies of "touching" the landscape:

1. carving into or extruding out of the cliff
2. building with natural or man-made materials
3. designing with light and shadow

Implementing these strategies of architectural form creates a procession through the site down to the water. The journey moves into and out from the rock forms and provides places along the way to stop and relax. The purpose of the project is to enable a new experience of engaging the site through the interaction of architecture and landscape.

Thesis Advisor: Imre Halasz, Professor Emeritus

Acknowledgments

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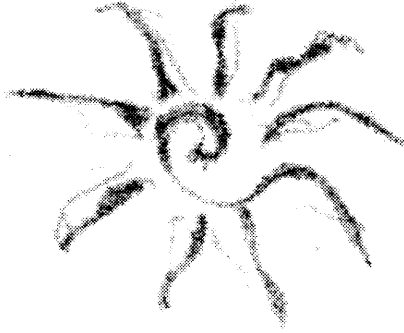
Sam, the thesis expert, who helped in printing and editing this thesis.

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Thank you!

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fig. 9.1 At the beach as a child.

Where it all began...

"The voice of thunder was the first sign to man of a larger power than himself."

Joseph Cambell, *The Soul of the Ancients*.¹

The experience of being born and raised in Hawaii and then moving to the "mainland" for a couple of years has given me a better appreciation for the beauty of the islands' landscape. Presently, I realize how much I took for granted in the sunshine, trade winds, white sand beaches, and tropical climate. There is always a special feeling of returning to Hawaii and finding those beautiful places in nature, which stimulate the senses.

Julie Moir Messervy, landscape architect and author of The Inward Garden, attributes the feelings drawn from a landscape to the memories of birth and childhood. There are forms in nature which provide enclosure and security, like being in the mother's womb, and those that stimulate openness and freedom, similar to leaving the home and gaining independence. Some forms of enclosure include harbors, caves, and the immersion in water, while promontories, mountains, and the sky evoke feelings of freedom.²

The large scale of natural forms can be reduced to a human scale of man-made places, which allow for the same feelings of enclosure and openness. For example, an extruded balcony is open to the sky, and a small window seat offers a feeling of prospect and refuge from the outside.

Having grown up in Hawaii and experiencing the landscape, the site for this exploration is located in the islands. This thesis is a personal search for understanding the passion of the landscape and its relationship to architecture.



Site Information

The marriage of Pele, goddess of earth and fire, and Kamapuaa, god of water, was short and violent. In a rage she routed him from her crater of fire and chased him with streams of lava into the sea.

Hawaiian legend³

Geology of the Hawaiian Islands

They appear only as tiny dots in the middle of the Pacific Ocean, but the Hawaiian Islands are in reality the tops of a range of volcanic mountains. They are one of the greatest mountain ranges on earth built up from the sea floor by lava flows.⁴

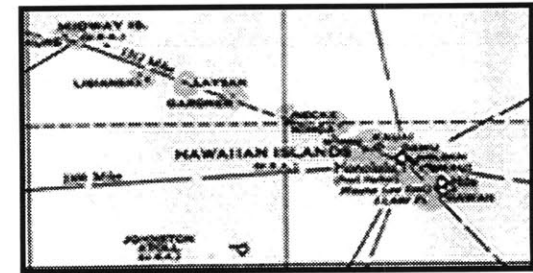


fig. 12.1 The Hawaiian Islands.

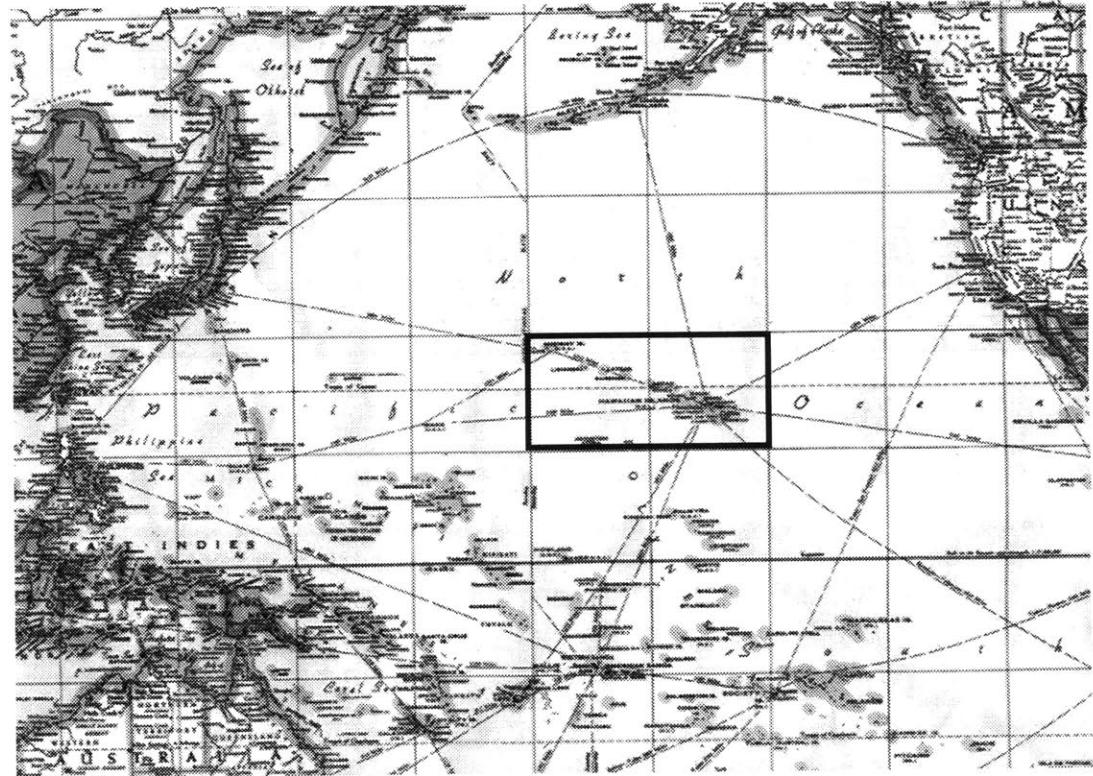
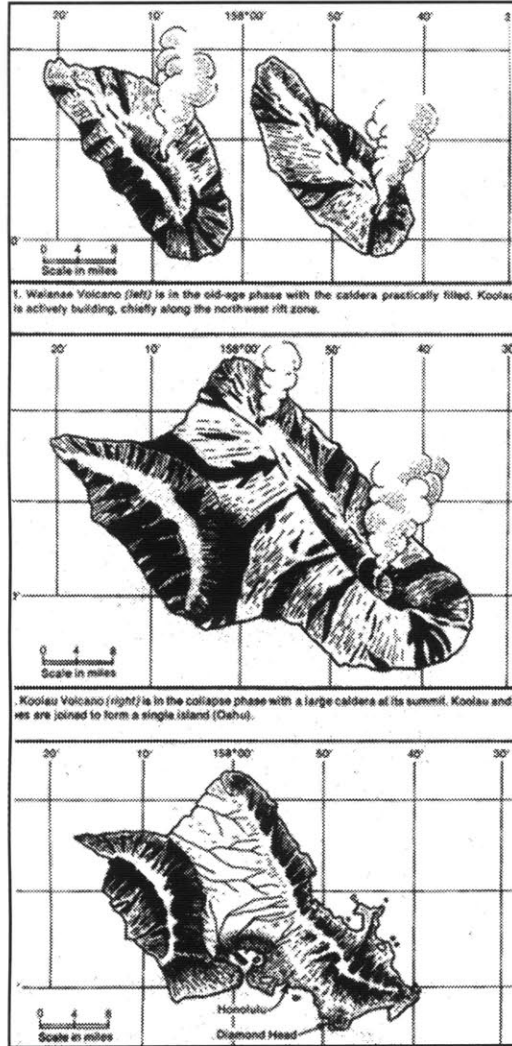


fig. 12.2 The Pacific Ocean.



Formation of Oahu

Oahu consists of two major lava domes, the Waianae and Koolau volcanoes, which formed along parallel fissures. In the beginning, the two masses joined to form a single island. As time went on, great dome-like piles of basaltic lava reached the surface of the sea. As long as the volcanoes were active, the island continued to grow. However, when volcanic activity ended, the power of erosion took over. The great slopes were carved away by wind, rainfall, and waves to produce the profile of Oahu today.⁵

fig. 13.1 The geological formation of Oahu.

Climate

There are only two seasons in most areas of Hawaii. Summers occur between May and October, when the sun is nearly overhead. The weather is warmer and drier, and the trade winds are most persistent. The other season is winter, between October and April, when the sun is in the south, the weather cooler, and the trade winds are more often interrupted by other winds and by intervals of widespread clouds and rain.⁶

Usually images of Hawaii involve lush green mountains and sunny white sand beaches. These places do exist, but there are also regions of arid and rocky land, which is the description of the area for this thesis.

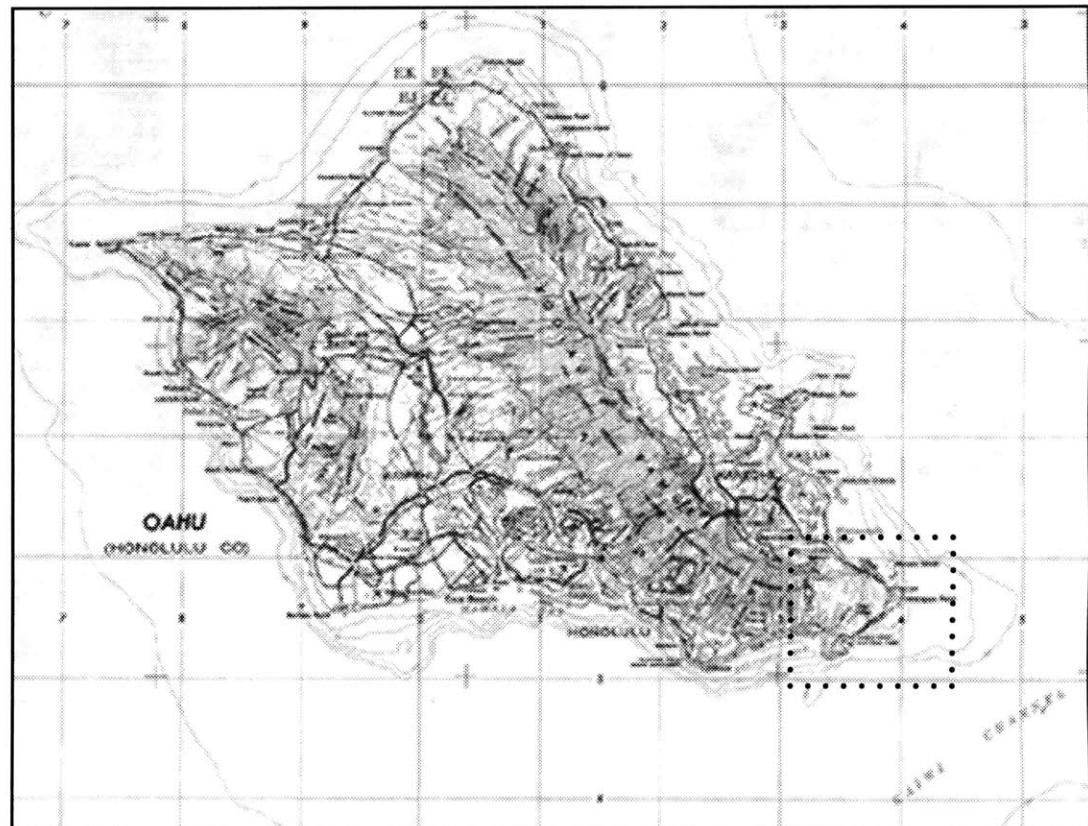


fig. 14.1 The island of Oahu.

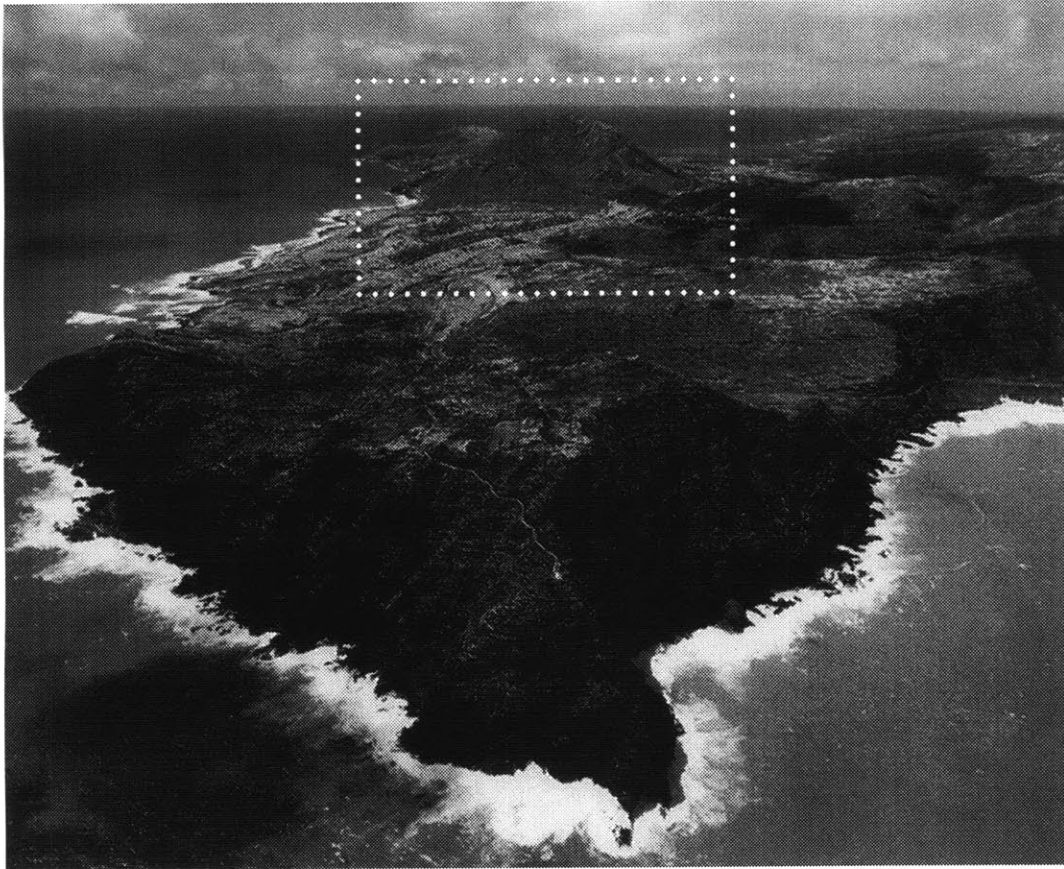


fig. 15.1 Mokapu Peninsula in the foreground and Koko Crater in the background.

Specifically, the site is located on the south shore of Oahu. There is very little vegetation on the land, which is a solid formation of volcanic rock.

This area has high speed northeast trade winds traveling between 12 to 15 mph, which increases comfort levels during the day.⁷

Geology of Koko Crater

Volcanic landforms are the results of opposing constructive and destructive forces. The construction of the multiple cones on the southeast side of Oahu occurred in the later stages of the formation of the island, as violent eruptions. Koko Crater is a steep tuff cone around 2,600 feet in diameter and 1,200 feet in height.

During the eruption, hot, water saturated tephra was blasted into the air and deposited in startlingly steep slopes due to its stickiness. The asymmetrical form is the result of the strong north-east trade winds blowing at the time. These winds scattered deposits to the downside of the crater.

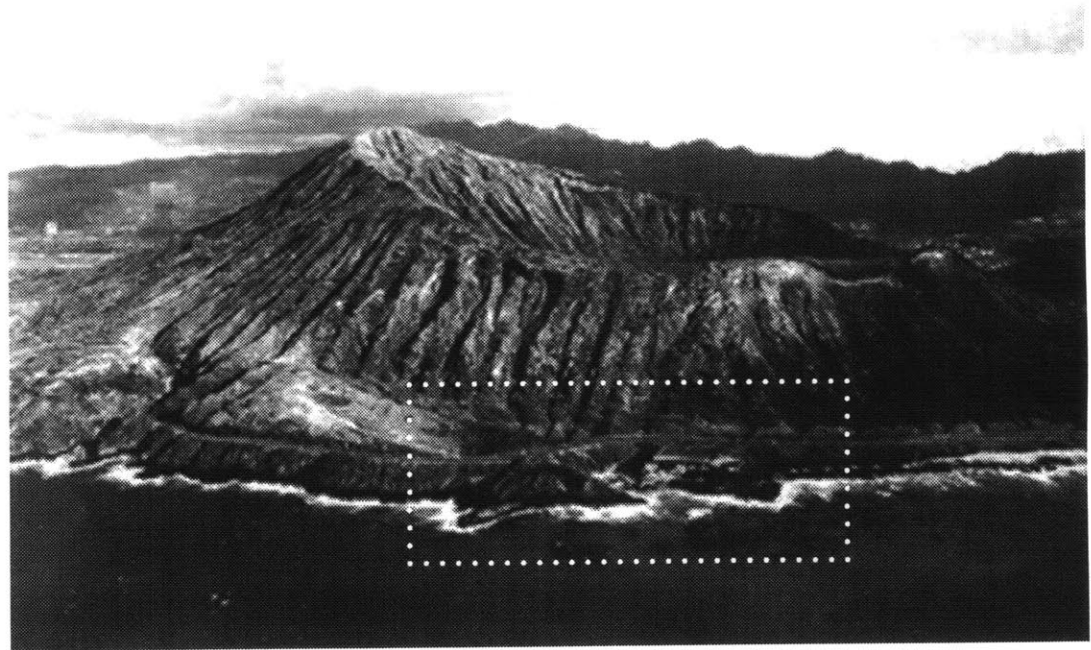


fig. 16.1 Koko Crater.



fig. 17.1 The southeast coast of Oahu.

Constructive forces build up landscape forms, while destructive forces sculpt and carve the topography. The effects of rainfall are evident in the ribbings running down its side. Furthermore, the rough edges along the coast are due to decades of wind and the crashing waves of Kaiwi Channel.⁸

These natural forces create a topography which is homogeneous in material, but with much variation in configuration.

Vicinity Description

The site lies within Koko Head Regional Park, which is adjacent to the Hawaii Kai and Portlock developments. Extending from these housing developments, the two-lane, Kalanianaʻole Highway winds between two prominent natural landmarks in the area, Koko Crater and Koko Head. Along this portion of the highway is Hanauma Bay, which is an amazing place for snorkeling and seeing many sea animals. The road makes an abrupt turn to the northeast and meanders along the coastal cliffs. There is a rifle range in the smaller Kahauloa Crater located in the saddle of Koko Crater and Koko Head. In addition, a botanical garden is situated within Koko Crater.⁹

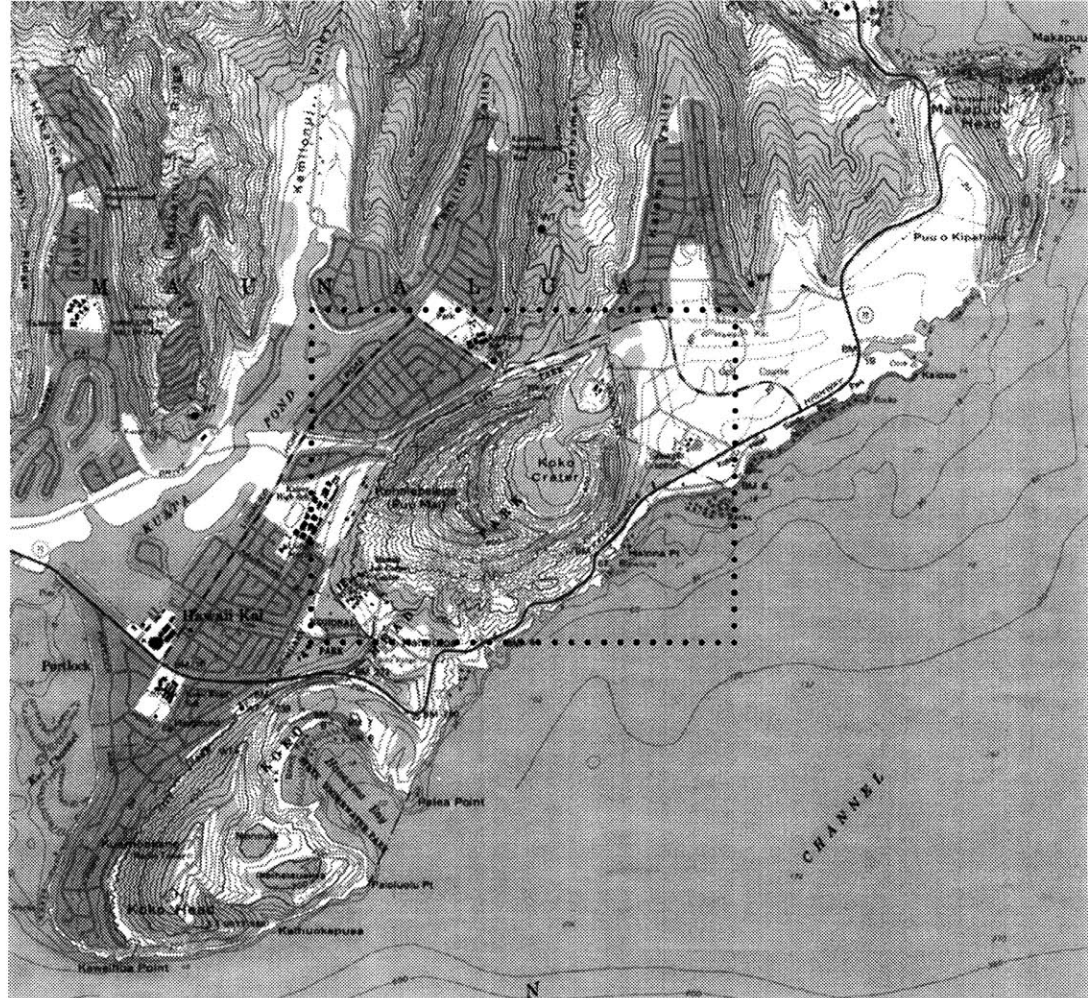


fig. 18.1 Map of southeast Oahu.



fig. 19.1 Aerial view of southeast Oahu, showing Hanauma Bay, Kahauloa Crater, and part of Koko Crater.

Discovery by Car

The car is free to travel along the highway in one sweeping motion. However, there are two lookout points, Lanai Island lookout across the rifle range and Halona Point, where the cliffs begins to flatten out. Here, the highway goes on for approximately a mile next to Sandy Beach Park, which is a long stretch of white sand beach known for its surfing competitions during the summer months. After passing Sandy Beach, Kalanianaʻole Highway turns inland and continues on.¹⁰



fig. 20.1 Drive down southeast coast (top).
fig. 20.2 Halona Point viewed from Sandy
Beach (bottom).



fig. 21.1 Aerial view of Koko Crater and vicinity.

Site Discovery

"The initial mystery that attends any journey is: how did the traveler reach his starting point in the first place? How did I reach the window, the walls, the fireplace, the room itself; how do I happen to be beneath this ceiling and above this floor? Oh, that is a matter for conjecture, for argument pro and con, for research, supposition, dialectic! I can hardly remember how. Unlike Livingstone, on the verge of darkest Africa, I have no maps to hand, no globe of the terrestrial or the celestial spheres, no chart of mountains, lakes, no sextant, no artificial horizon. If ever I possessed a compass, it has long since disappeared. There must be, however, some reasonable explanation for my presence here. Some step started me toward this point, as opposed to all other points on the habitable globe. I must consider; I must discover it."

Louise Bogan, *Journey Around My Room*¹¹

North Section of Site

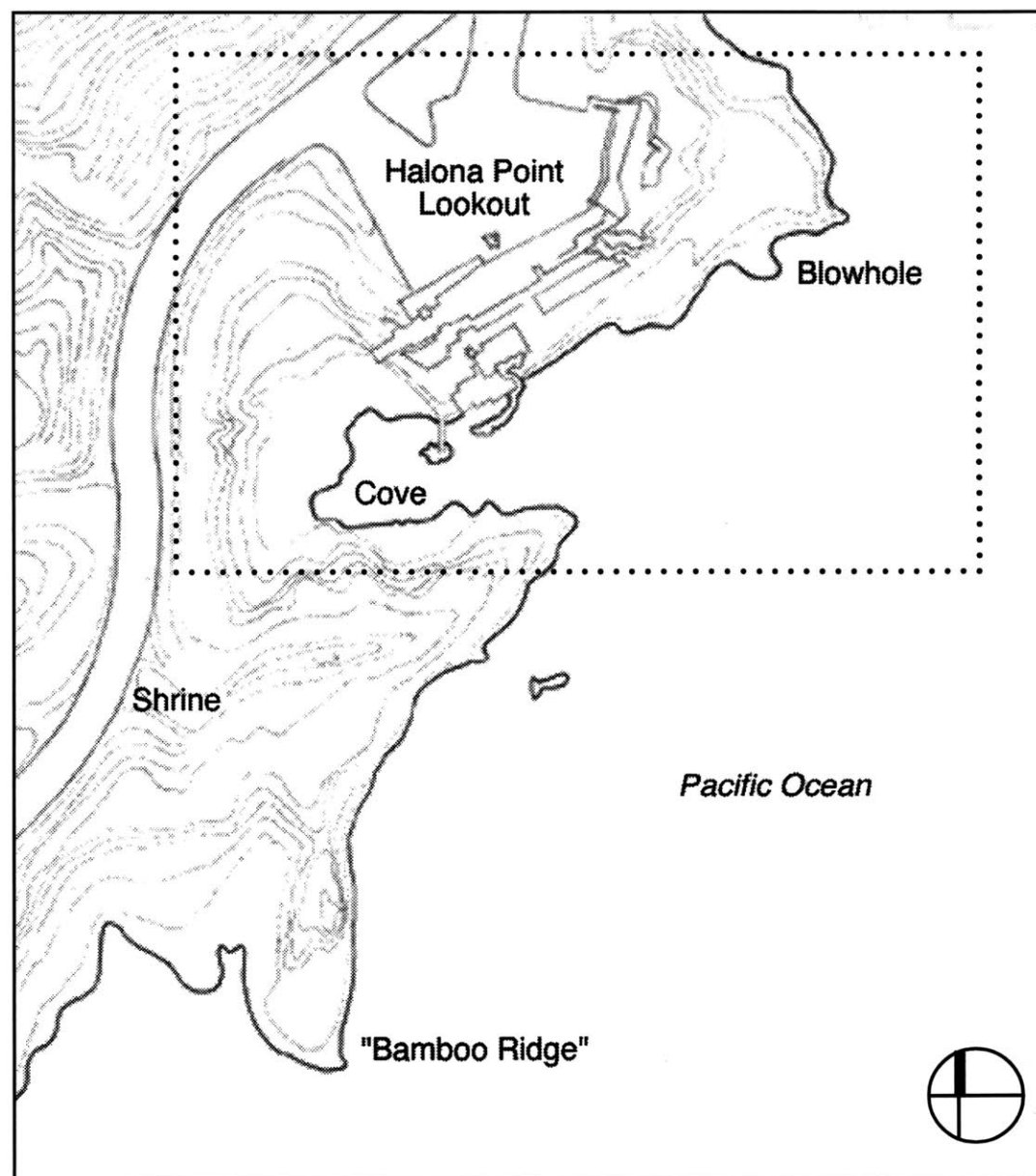


fig. 24.1 Map of north section of site.



fig. 25.1 View across cove to Halona Point
lookout.

Halona Point

The lookout at Halona Point marks the highway with the presence of a large parking lot. It is one of the built spots along the coast. People use the parking lot as a place from which to take the opportunity to view the blowhole — a natural opening in the rocks where water spouts out due to the pressure of the waves breaking on shore. Beyond the blowhole lies the great Pacific Ocean and the horizon. On a clear day, the island of Molokai can be seen across the channel. Most tourists stay only for a few minutes to take a picture, and then drive off to their next destination.

There is a beautiful view of the sunrise early in the morning. The air is crisp, and the winds blow as strong as in the day. The sun peaks over the horizon as you look down towards the shores of Sandy Beach. Occasionally there is a brief rainfall that comes in from the ocean, but it only lasts for a few minutes.

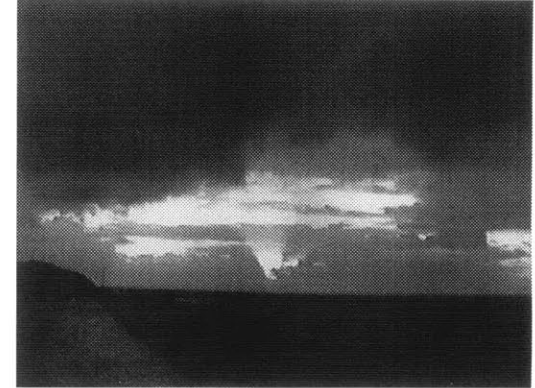


fig. 26.1 The sunrise at Halona Point.



fig. 27.1 Spouting water from blowhole.

Cove

Another landform on the site is the cove, completing the convex form of the lookout. Those who know about this place swim and relax here during the day. Presently, the only access to the beach is by climbing down a rocky slope near the highway.

People exploring the cove climb up and down the sides of the cliff and try to move out beyond the mouth. The mystery and wonder of what lies around the corner tempts many people, even with the rough surf crashing on the rocks.



fig. 28.1 View out to the horizon.

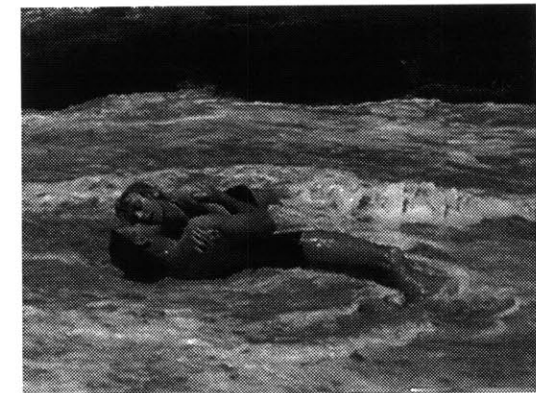
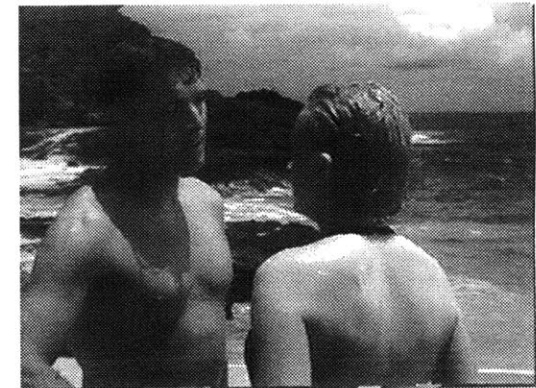


fig. 29.1 Existing pathway down into cove (top).
fig. 29.2 View to highway above cove (center).
fig. 29.3 Climbing rock walls (bottom).

Cove

The character of the place changes in the early morning and late afternoon when the swimmers have gone home. The cove becomes very peaceful with the tide moving in and out. The bright sunlight disappears, and the walls of the cove protect against the strong winds. At times, young people camp illegally overnight, but it is understandable in such a beautiful setting. The waves lull the people to sleep at night, and in the morning the sun rises to wake awaken them.

There is no mystery why this very cove was the setting for the famous love scene from the 1953 movie, From Here to Eternity. The characters played by Burt Lancaster and Deborah Kerr found their place in paradise where they could be in a world of their own.



figs. 30.1 - 30.3 Scenes from the movie, **From Here to Eternity**, filmed in the cove.

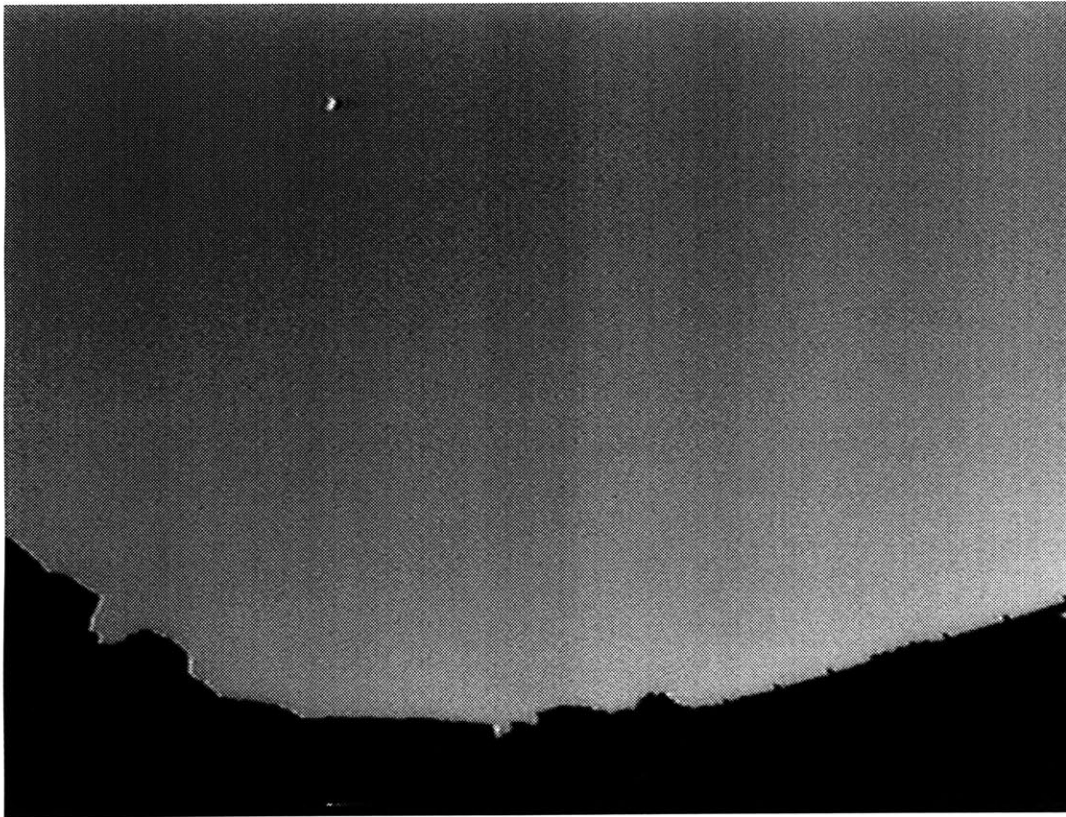


fig. 31.1 View of moon at dusk.

South Section of Site

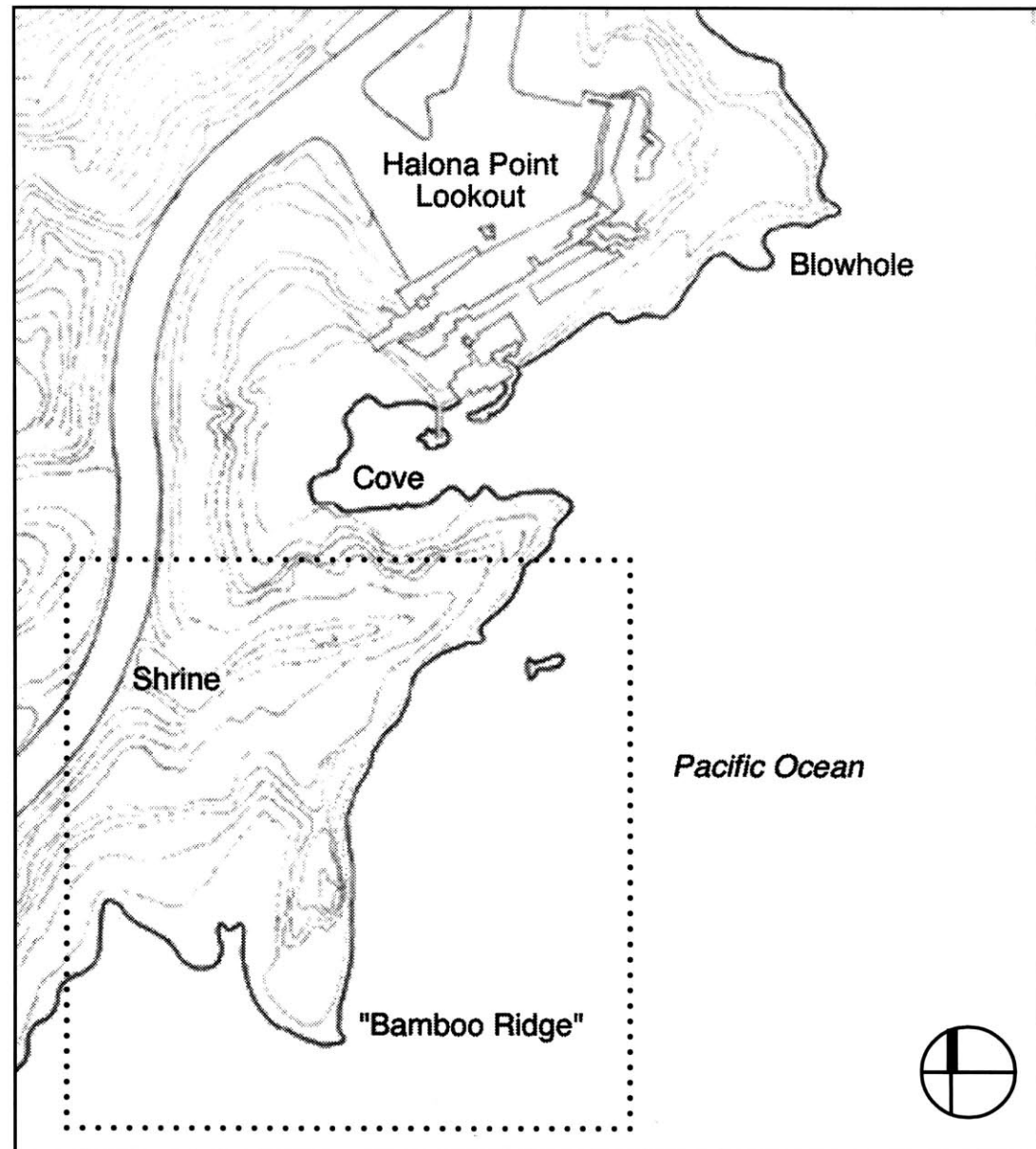


fig. 32.1 Map of south section of site.

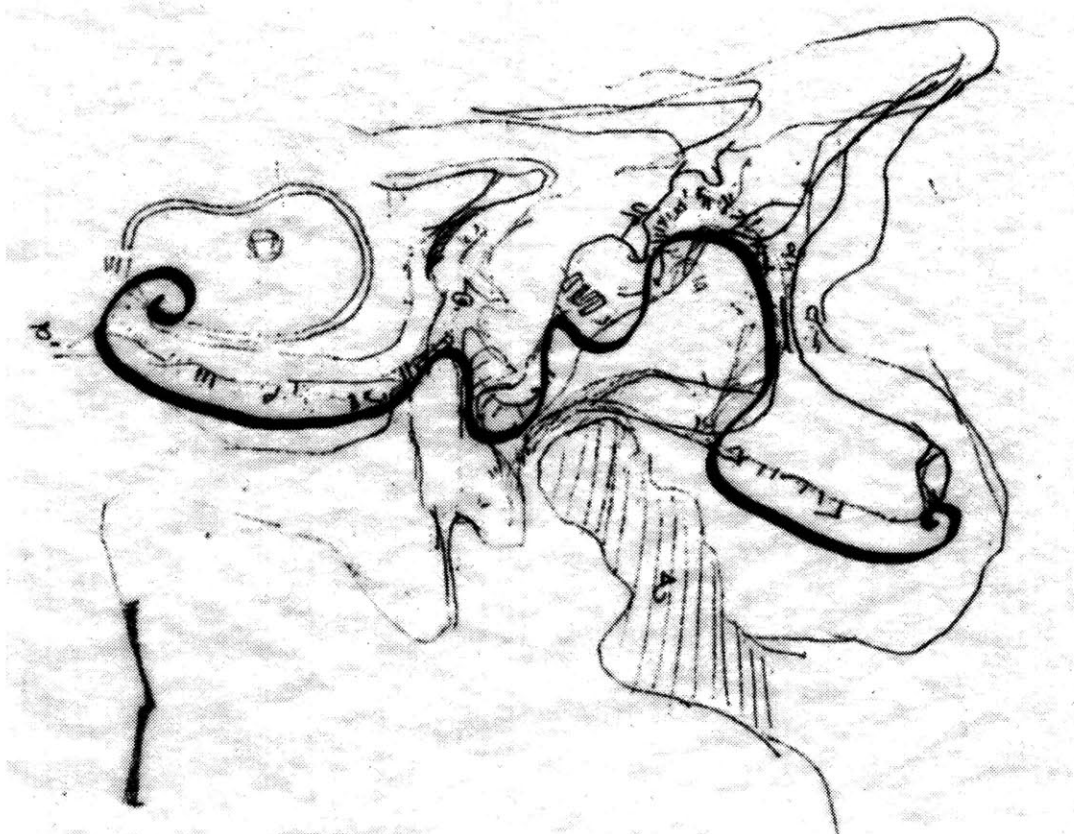


fig. 33.1 Mapping path to "bamboo ridge"
from shrine.

Japanese Casting Club Shrine

Gazing up the south side of the cove, there is glimpse of some type of built form near the road, but no apparent way to get there. One option is to climb back up to the highway and walk along the road, risking the hazard of on-coming cars. The second is to drive to Lanai lookout, turn around, drive back to the site, and park it close to where the road widens in front.

This limited access protects this area from many tourists. The built form is a small stone shrine surrounded by a rock wall. It was placed there by the Japanese Casting Club of Honolulu. People still leave offerings to protect the many men and women who fish beyond the south wall of the cove, at "Bamboo Ridge."

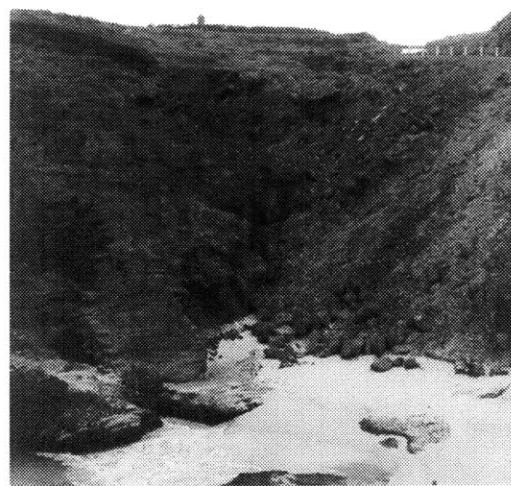


fig. 34.1 View to shrine from cove (left).



fig. 34.2 Shrine (right).

Existing Pathway

An individual or group of people built a path down the opposite side of the ridge to the water's edge. The same group who placed the castingshrine above could have been responsible, since the trail leads to the fishing area. This path meanders down the side of the cliff, but the boundary of the path is not clearly delineated. Every so often, steps are carved into the rock and white lines are painted on them for better visibility. There is a wooden platform to walk over a large crevice and reflectors to find the path at night.

The journey down is not an easy one, especially for the fishermen who carry their poles and equipment. Hidden from view behind a large rock formation is a setup for fishing, consisting of a concrete slab and two benches used for sitting and holding supplies.



fig. 35.1 Carving stairs into rock.

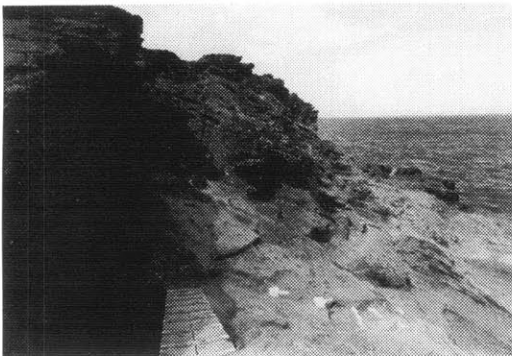


fig. 35.2 Carving stairs into rock (left).

fig. 35.3 A fisherman's journey (right).

“Bamboo Ridge”

The area called “Bamboo Ridge” lies south of the cove. The place obtained its name due to the large number of men and women who go off-shore fishing from this ridge. Their bamboo poles line up along the edge after they have been cast out to the ocean. Most of the fishermen are local residents, who have been here for years. There are some families who spend an entire day fishing here.

However, another fascinating part of this area is the tidal pools with its many diverse sea creatures. A person would never become bored exploring the nooks and crannies.

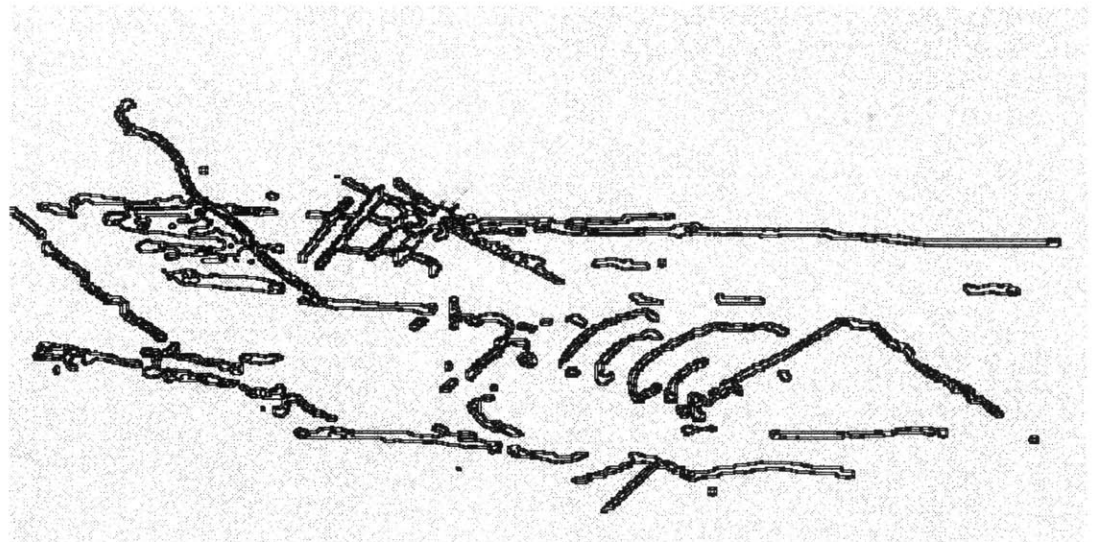
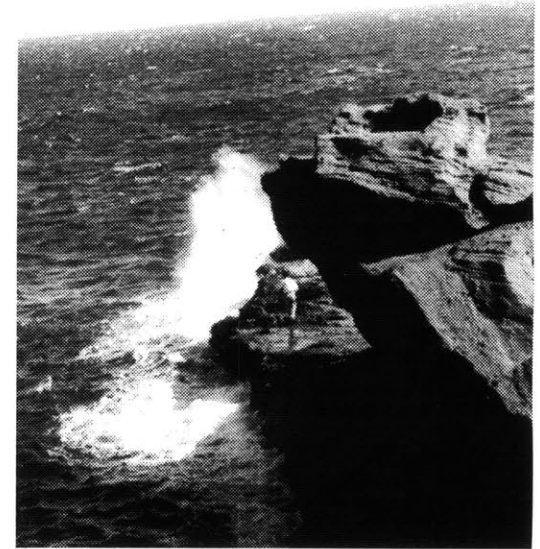


fig. 36.1 Sketch of fishing poles (top).

fig. 36.2 Casting lines out to sea (bottom).

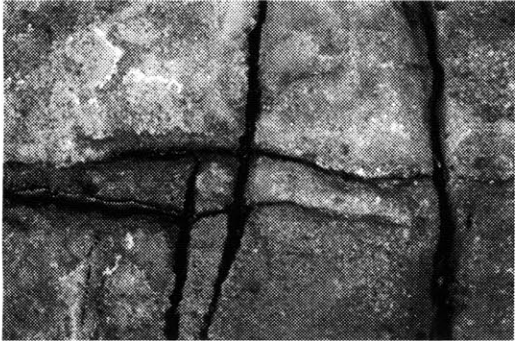
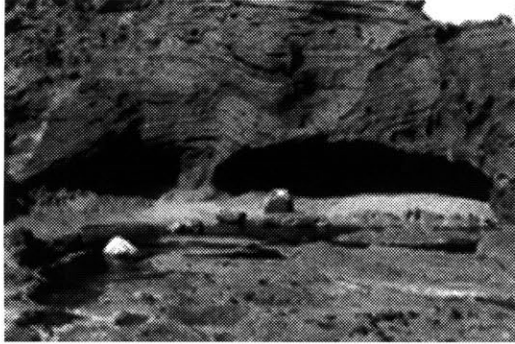


fig. 37.1 Eroded cave-like forms (top).

fig. 37.2 Small crevices in the rock created by water run-off (center).

fig. 37.3 Sea creatures in tidal pools (bottom).

Exploration

“As we grow and learn to explore the world outside our mother’s body, we begin to link our first feelings to the landscape around us, viewing it almost as an animate being. No matter how old we are, we never lose entirely these primal feelings toward the earth. Instead, they float beneath the surface of our adult lives, revived by images of natural beauty.... In such moments we see nature again as childlike creatures, open, fresh, curious, reverent. We feel again the power of Mother Earth as a living spirit, and bring this understanding to the designs we make upon her surface.”

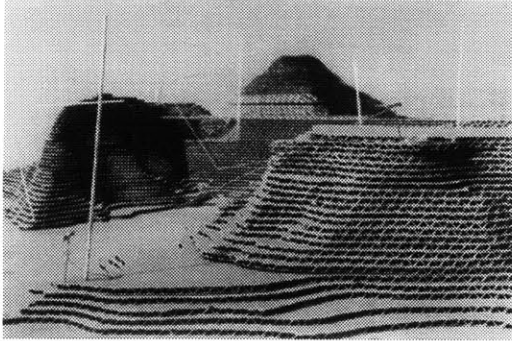
Julie Moir Messervy, *The Inward Garden*¹²

The Approach

After discovering the site in Hawaii, several possibilities for the program and areas to build upon were explored. This approach is entirely different from the problem-solving process of fitting a given program into a specific site. Instead, what was appropriate for the site was gathered from the site itself.



fig. 40.1 Initial idea for building below the cliff.



Understanding the Site

A better discernment for the site was achieved by marking particular nodes, and discovering why they were so intriguing.

One model identified points on the site with vertical elements, which were tied together in straight lines. The model unearthed an understanding of the pitch of the land. Depending on a person's point-of-view, the pitch can be read as either upward, downward, or horizontal. As a person walks upon the land and changes his position, the topography is understood in the experience of movement.

Other models explored tying the north and south sections of the site together and were used to understand the water's edge. These models document the exploration over the entire site.

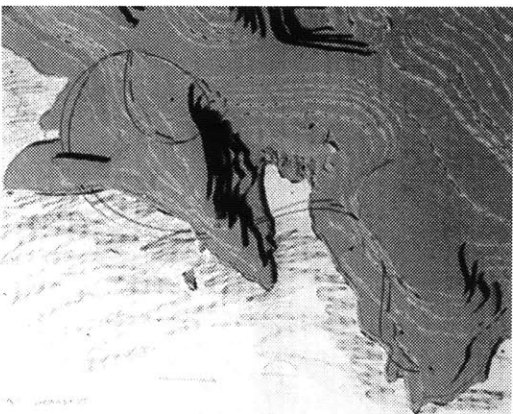
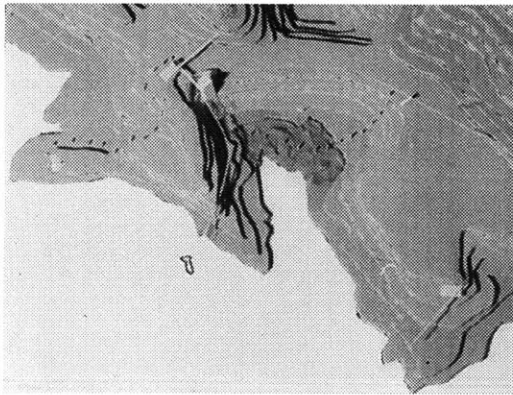


fig. 41.1 Modeling the pitch of the land (top).

fig. 41.2 Exploring movement through ridge (center).

fig. 41.2 Crossing over the water's edge (bottom).

Sketches

These sketches and watercolors were used in addition to the models to explore different possibilities for the site. The first attempt was to build against the wall of the cove, where one would feel the most protected. This included building on the ridge, located near the shrine, in order to view the cove from above. A second proposal was to carve a theater into the concave form.



fig. 42.1 A theater in the cove.



fig. 42.2 Pastel sketch exploring where to build in plan.



fig. 43.1 Building at the bottom of cliff and near shrine.

Program

The program for this thesis was derived from exploring the site. The initial program included designing a place for Zen meditation, which was an individual and contemplative way of experiencing the landscape. However, the final program was became a swimming facility, in order to build upon the activities which already existed at the site. A tentative program with its square footage requirements was established, and the design process became more specific. The decisions, of where to build and the extents of building were still undetermined.

A Swimming Facility

Access/Path	2,600 s.f.
Café	
Seating area	3,900 s.f.
Service area	1,000 s.f.
Swimming Facility	
Pool area	9,700 s.f.
Shower facilities	1,700 s.f.

Approximate gross area: 18,900 s.f.

The “Concept”

Since there is no strong connection between the parking lot at Halona Point and the water, a proposal is made to build on the cliff, which would enhance the landscape and provide a new experience down to the water. At its present state, the slope is too steep for anyone to occupy the side of the site; it is a solid rock wall. The design is a path with places along the way rather than an object on the cliff.

The journey allows movement in and out of the earth through a built complex of man-made and natural forms. The nature of the path changes after climbing on the cliff to the open swimming area below, and concludes at the beautiful enclosure of the cove. However, the question becomes how does one “touch” the land?

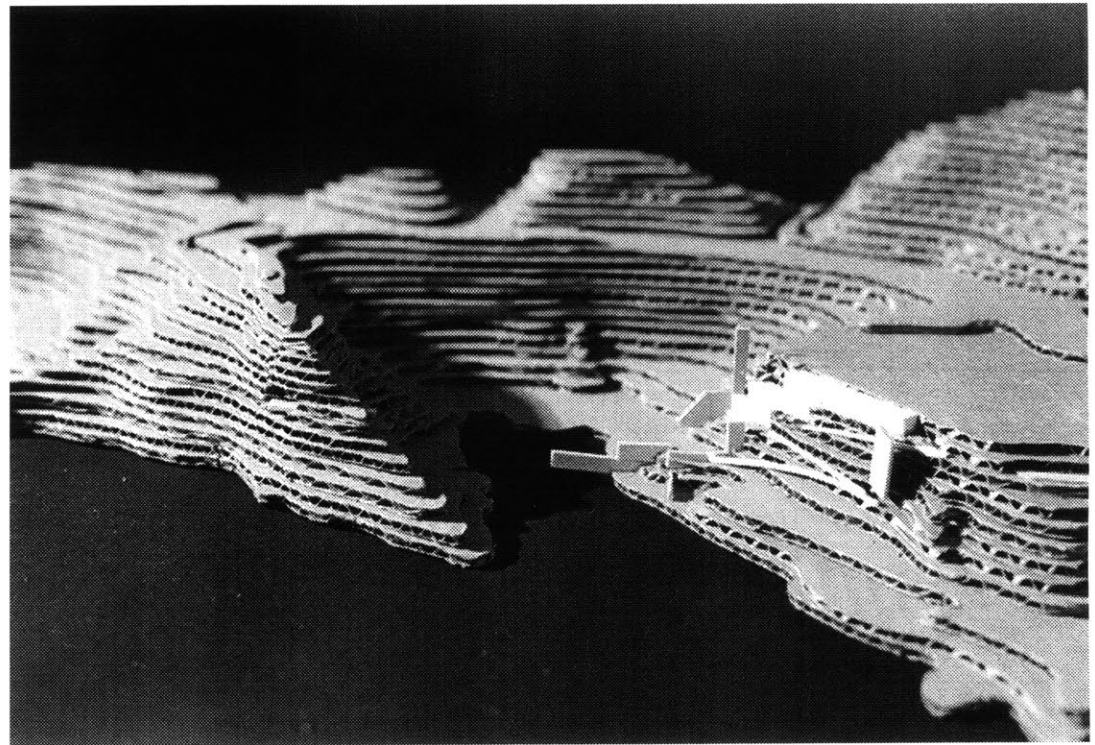


fig. 44.1 Massing model of built form.



fig. 45.1 Sketch describing moving from
built form to natural setting.

The Project

"The site transforms by displacement of elements. There are three basic displacements that together make all transformations in the site. The site can be transformed by addition of elements, it can be transformed through elimination of elements or elements can simply change their position in the site....Often, an instance of transformation is a combination of addition, elimination and movement.

N.J. Habraken, *Transformations of the Site* ¹³

A Journey to the Water's Edge: Enhancing the Experience in the Landscape

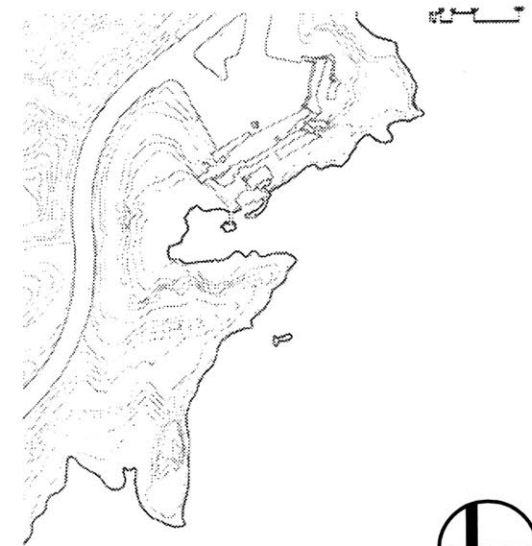


fig. 48.1 Site Plan

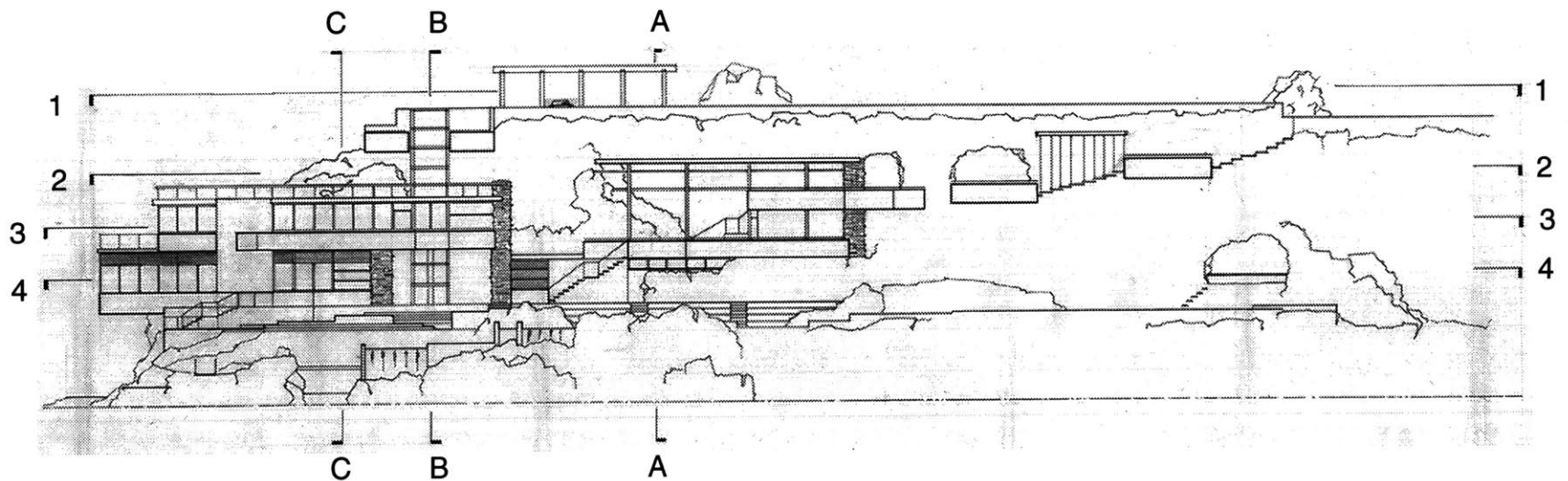


fig. 48.2 Elevation

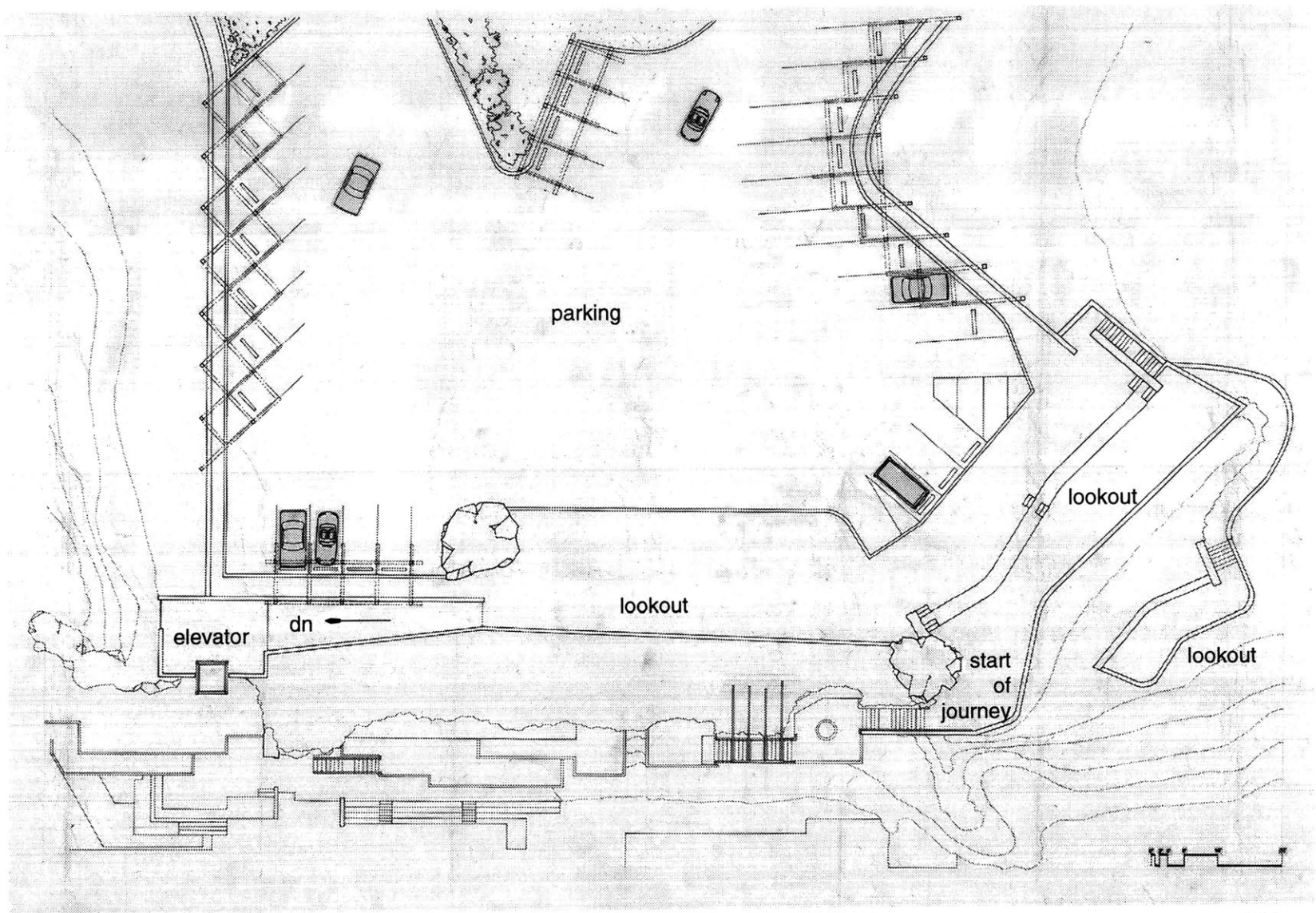


fig. 49.1 Parking Plan 1 - 1



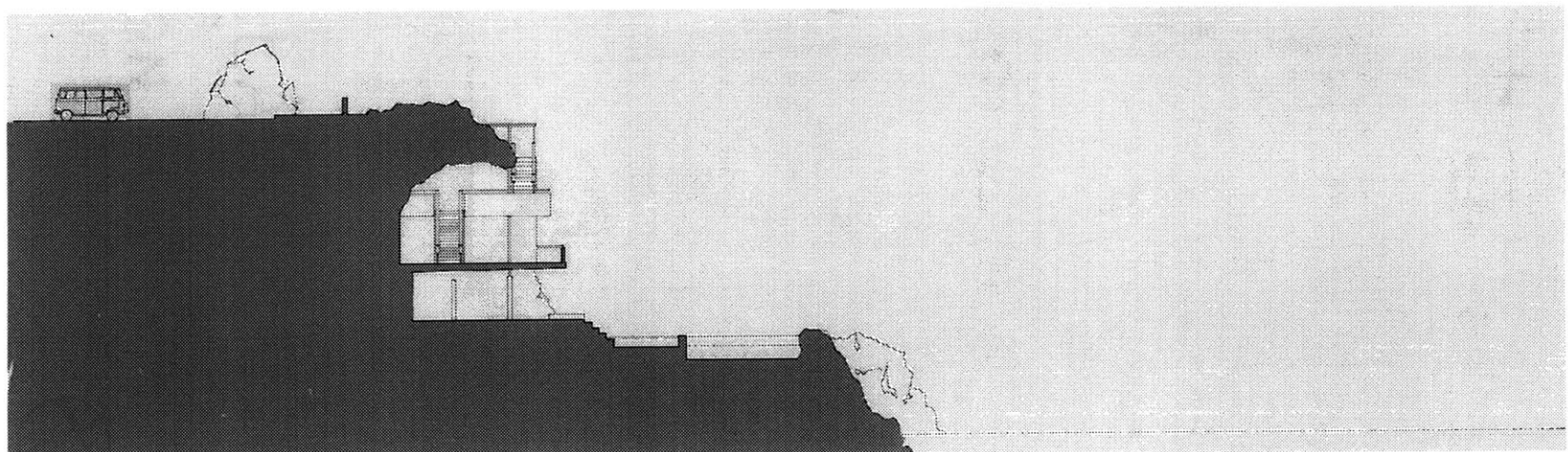


fig. 50.1 Section through Outdoor Cafe Seating and Swimming Facility A - A

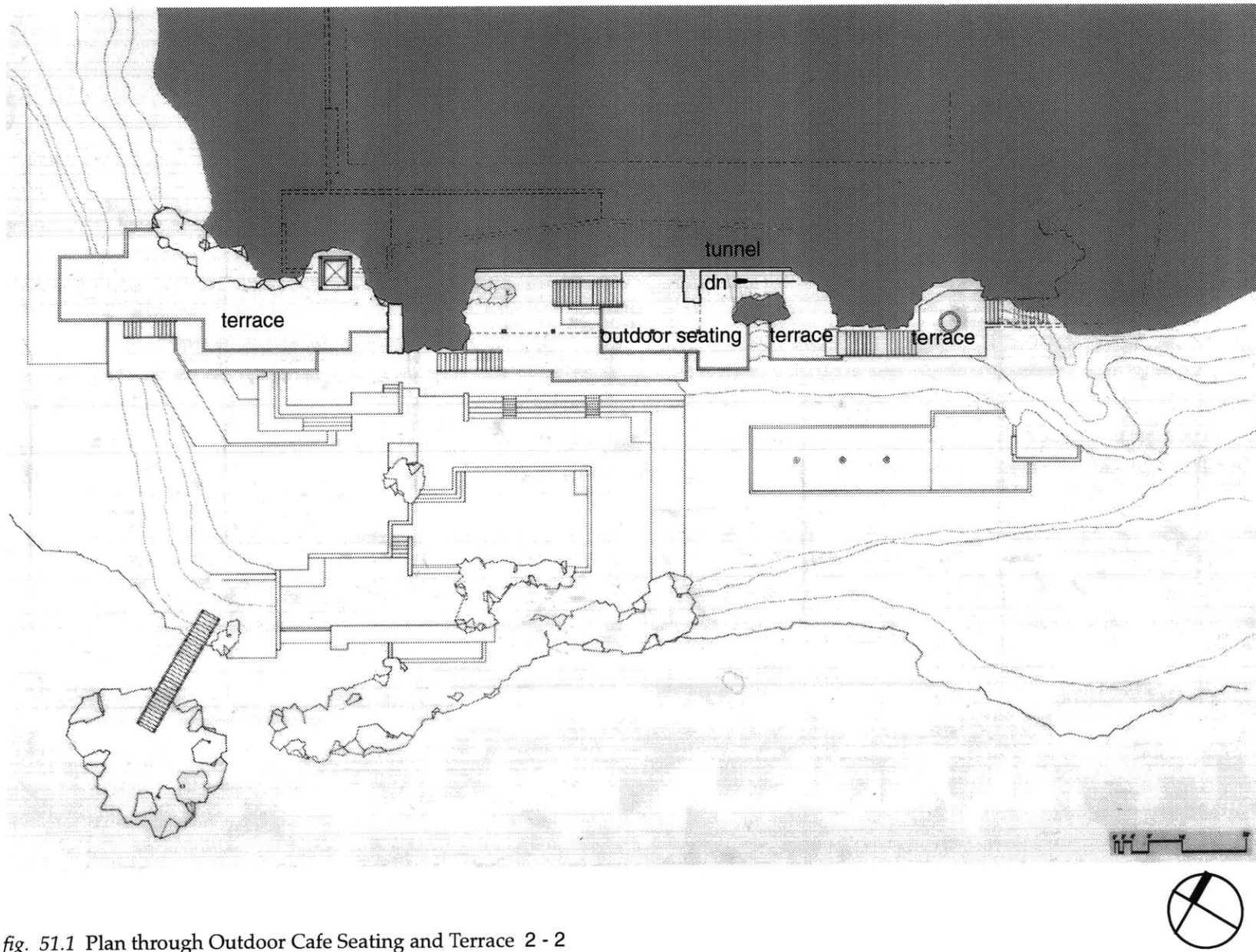


fig. 51.1 Plan through Outdoor Cafe Seating and Terrace 2 - 2

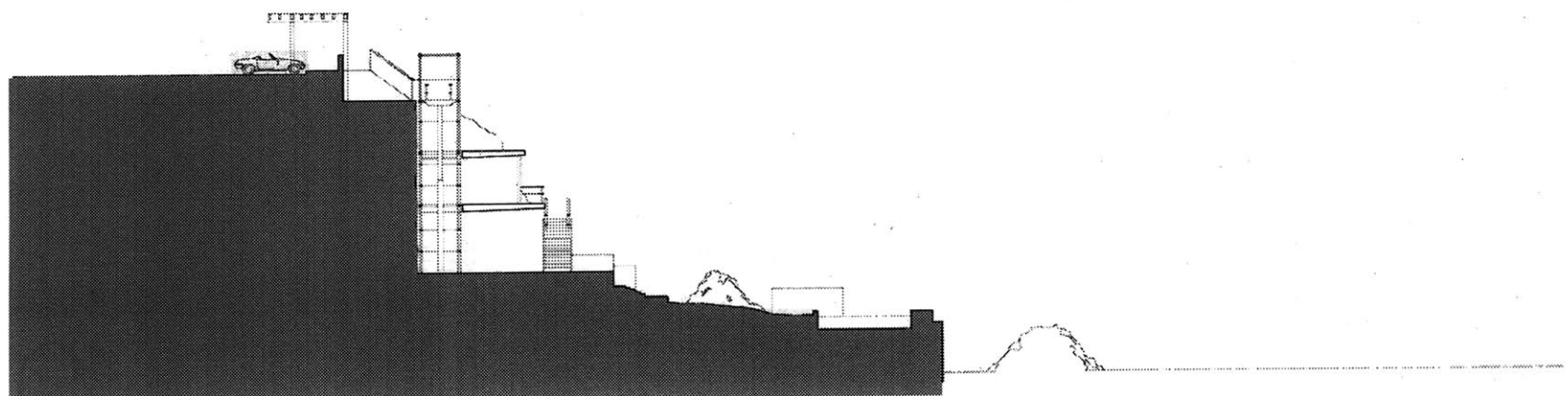


fig. 52.1 Section through Elevator B - B

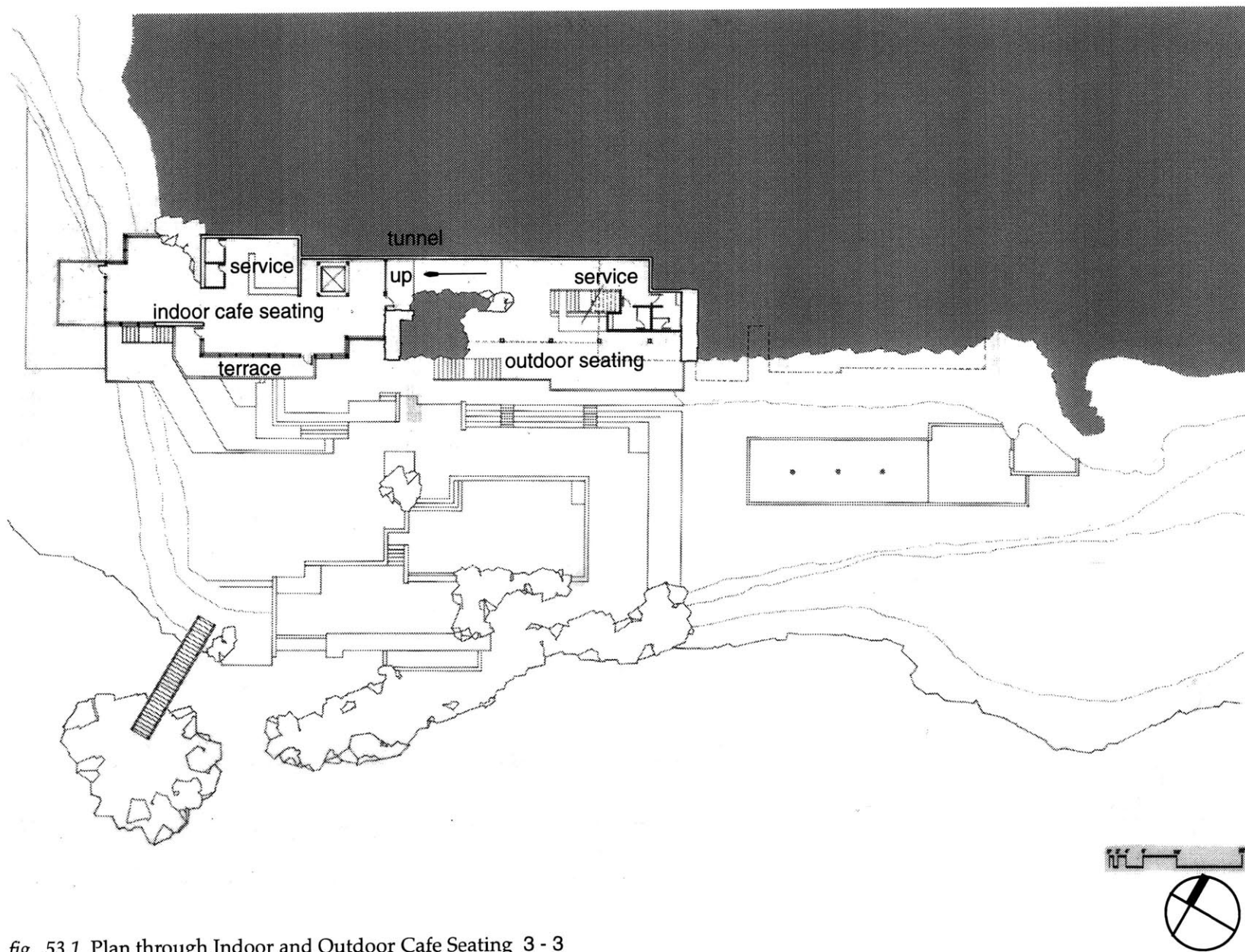


fig. 53.1 Plan through Indoor and Outdoor Cafe Seating 3 - 3

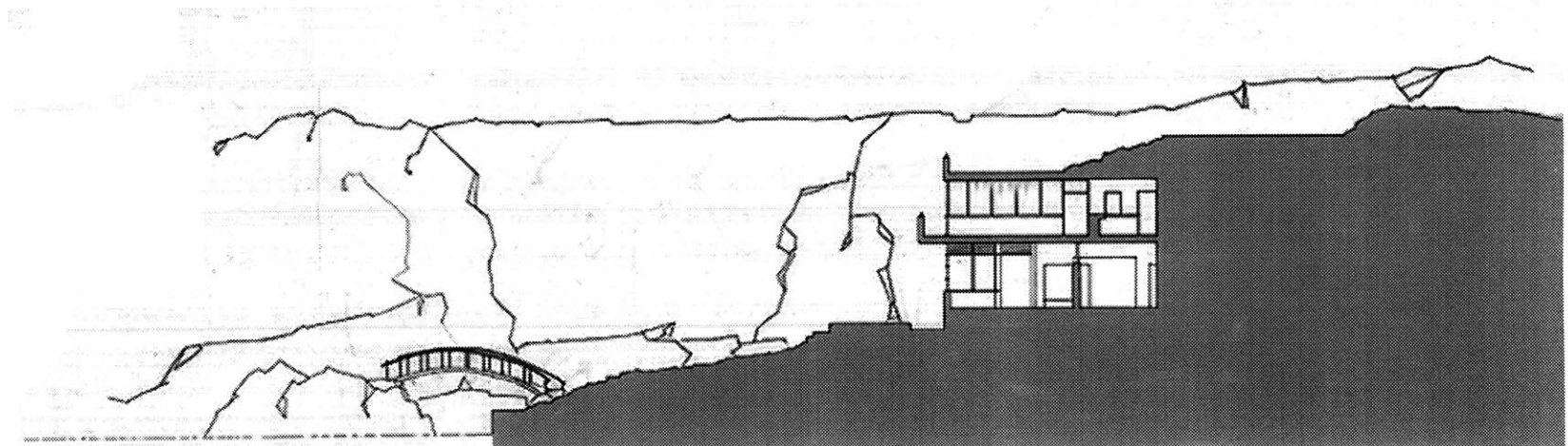


fig. 54.1 Section through Indoor Cafe and Swimming Facility C - C

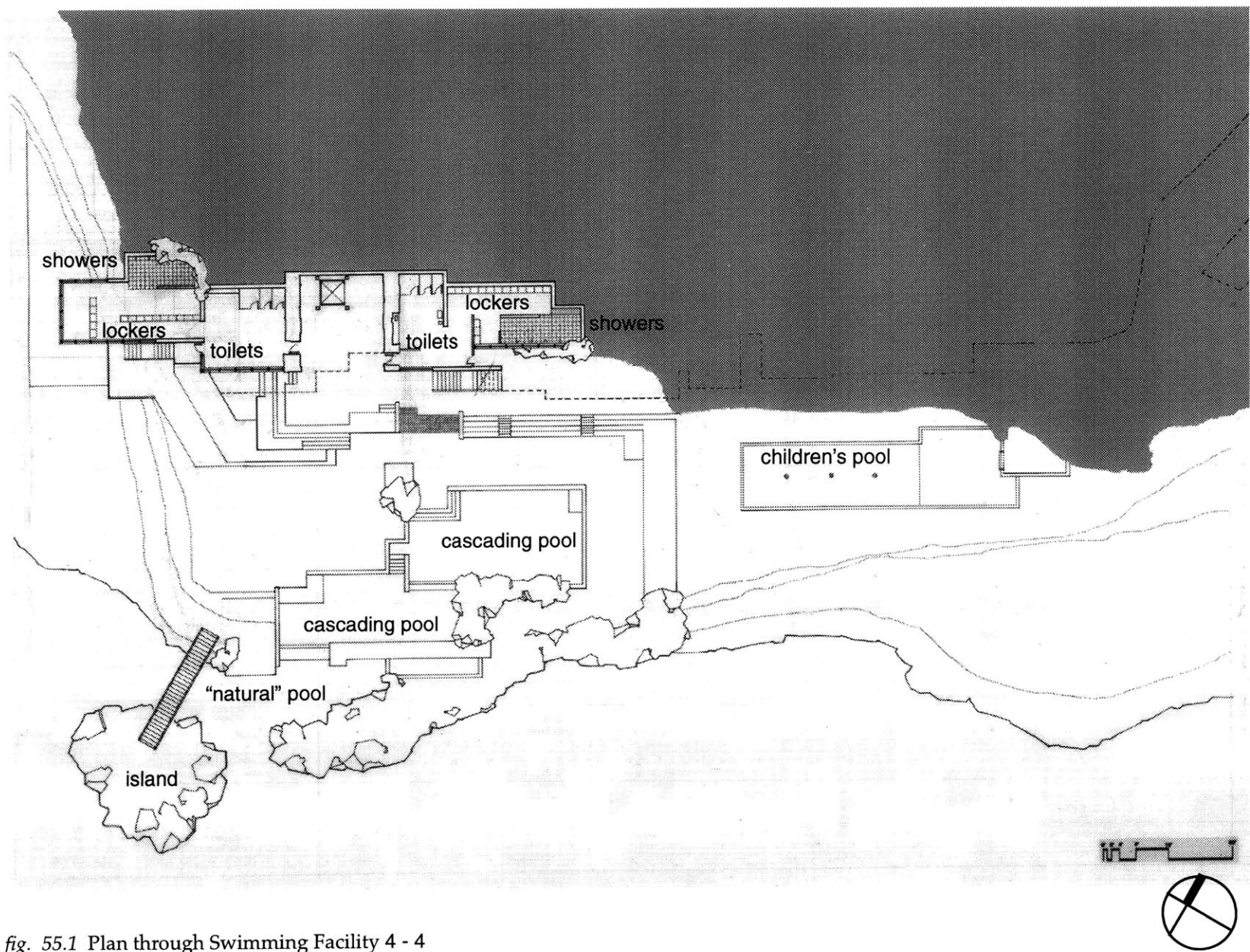


fig. 55.1 Plan through Swimming Facility 4 - 4

Design Objectives

"Isn't it marvelous that, out of what's around, you get the feeling that you make with the aid of nature what nature itself cannot make? Nature does not make a house, it does not make a motorcycle, it makes no airplane. Only through man are they made."

Louis I. Kahn¹⁴

Access

Parking Lot Treatment

The journey to the site begins in the car along Kalanianaʻole Highway. The parking lot marks the transition from a high speed vehicular movement to a slower pedestrian one. The car is parked under a light trellis, and then people are drawn towards the horizon by the view. Near the cliff edge, large rock sculptures and textured road paving are used to mark the pedestrian areas where the opportunity exists to view the vast ocean and coastal area.

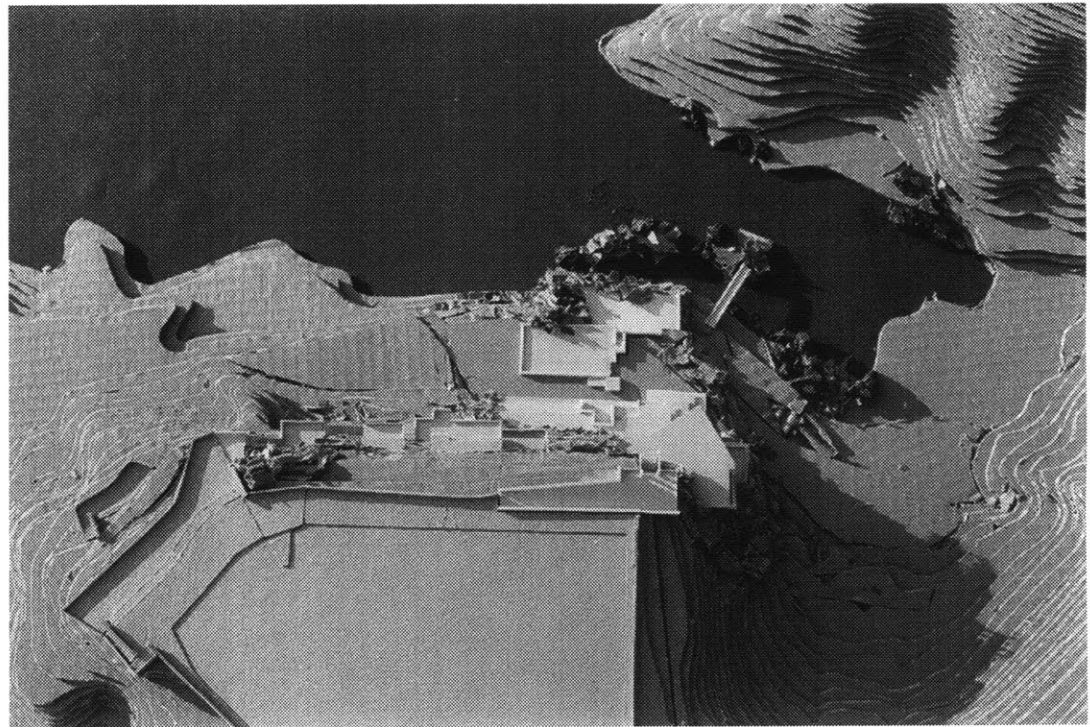


fig. 58.1 View from above.

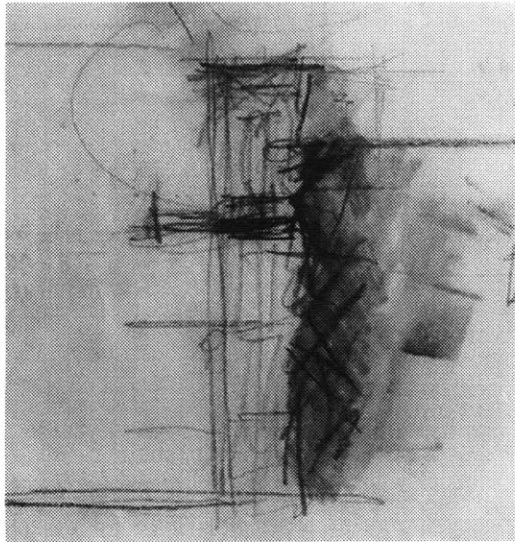


fig. 59.1 Experiencing the cliff face in the elevator.



Descending

There are two means of descending the cliff edge. The first is a meandering path beginning at the lookout platforms. The journey moves in and out of the cliff, stopping at different places along the way. These intersections of path and place allow for a greater interaction between people, especially in the outdoor café.

The other path leads people down a ramp to a glass elevator and allows for a quick passage down to the pools and swimming areas. The glass elevator allows the passengers to experience part of the rocky cliff face and also maintains a panoramic view to the ocean.

fig. 59.2 Journey down the cliff.

CARVING INTO THE CLIFF

The face of the cliff can be “touched” in many different ways, which in turn changes the experience of being there. Carving spaces into the cliff provides a feeling of protection and enclosure. Even though the sunshine and trade winds can be pleasant, at times people may feel more comfortable out of these natural elements.

There are many enclosed areas along the path where people are able to sit and look out to the horizon from a recess in the cliff.

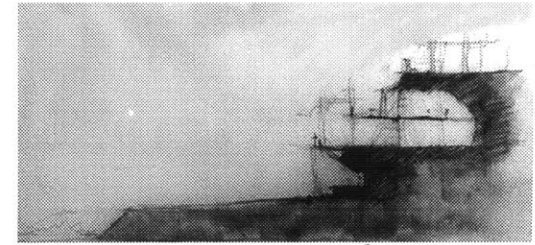


fig. 60.1 Section carving into the cliff.

EXTRUDING OUT OF THE CLIFF

The opposite of carving into the cliff is extruding out of it, where people feel free and open in the air. The platforms in the design extend out at different levels allowing visitors to peer over the railings at the next place of rest along the path. These platforms are seen from below, sometimes acting as both floors and ceilings.

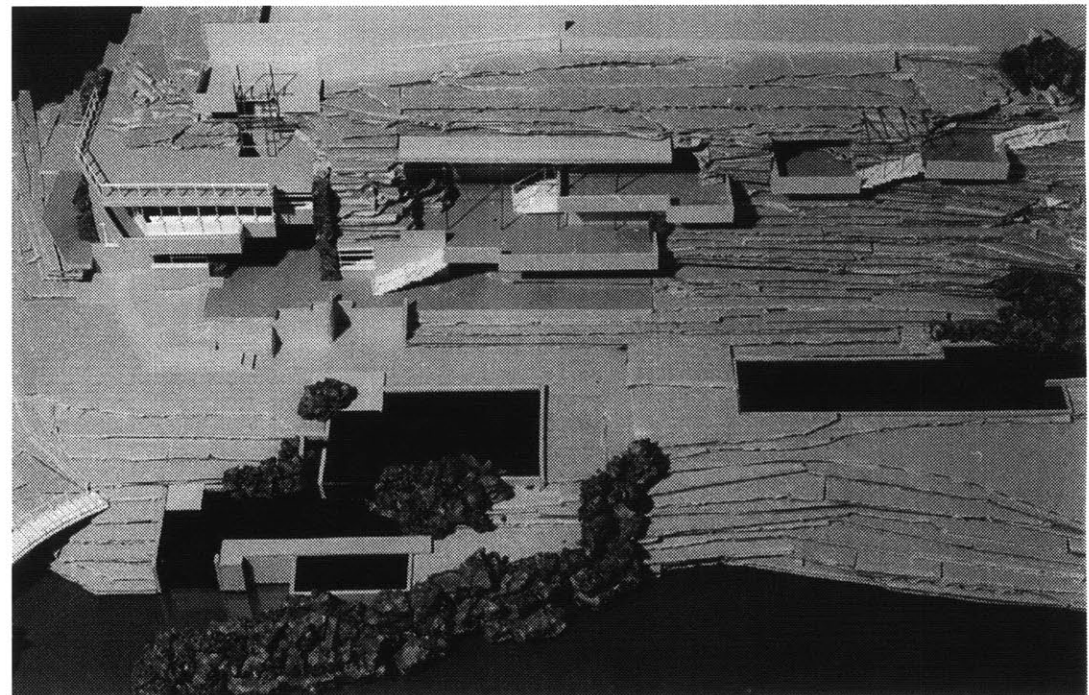


fig. 60.2 Carving and extruding.

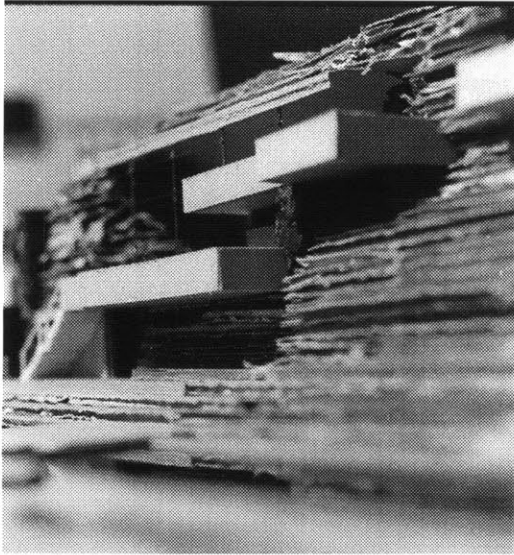


fig. 61.1 View from pools below.

SUSPENDING NEXT TO THE CLIFF

Another way of creating an open and free experience is by suspending the path next to the face of the cliff. The stairs at the beginning of the journey are suspended from above, creating an exhilarating sensation.

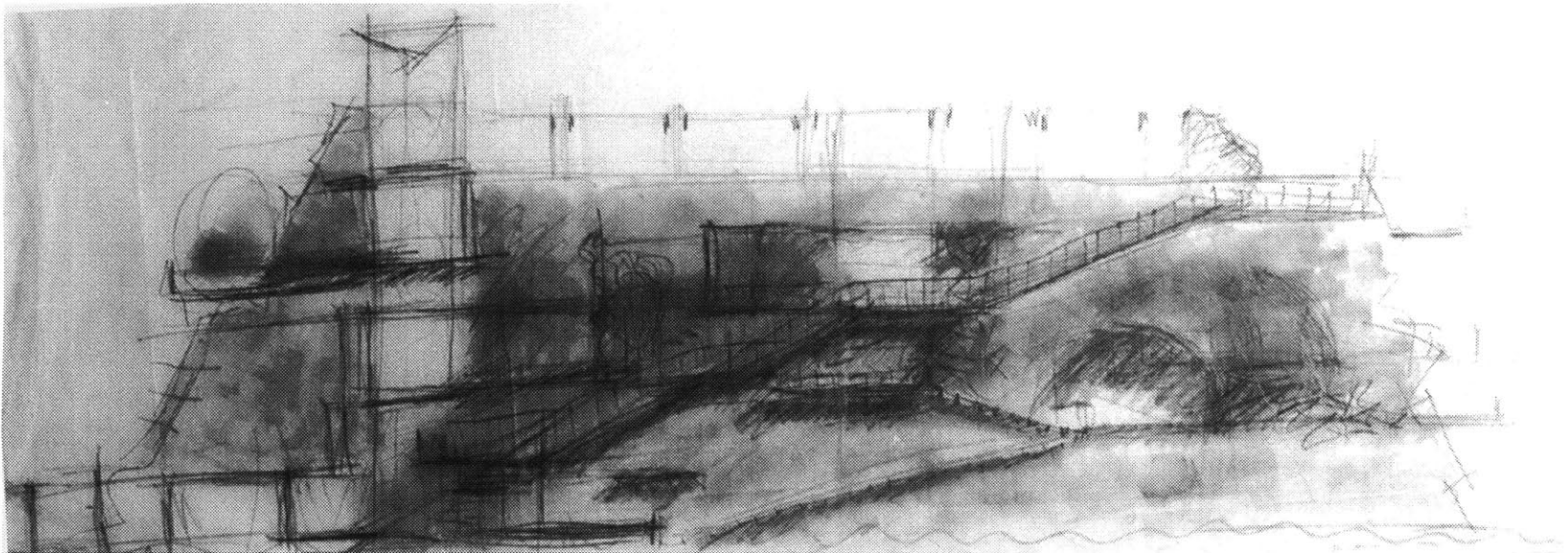


fig. 61.2 Charcoal sketch of elevation.

FOOTHILL OF CLIFF

The treatment of “touching” the land changes at the bottom of the cliff. Steps or terraces begin to define areas. The swimming facilities are located here next to the series of pools. The shallow pool is for children to splash about, while the deeper pools cascade water down to the ocean for those with better swimming abilities.

Around the pools there are sitting areas carved into the hill, like an outdoor theater. The seats are wide enough to lie on, as well as sit face to face with another person.

Furthermore, a man-made island is constructed in the water so that the territory of the pools is extended to the cove. This barrier calms the surf and creates a larger area in which to swim. People can also use the island for relaxation and play. A new perspective of the site is given when one looks back at the cove or cliff from out in the water.

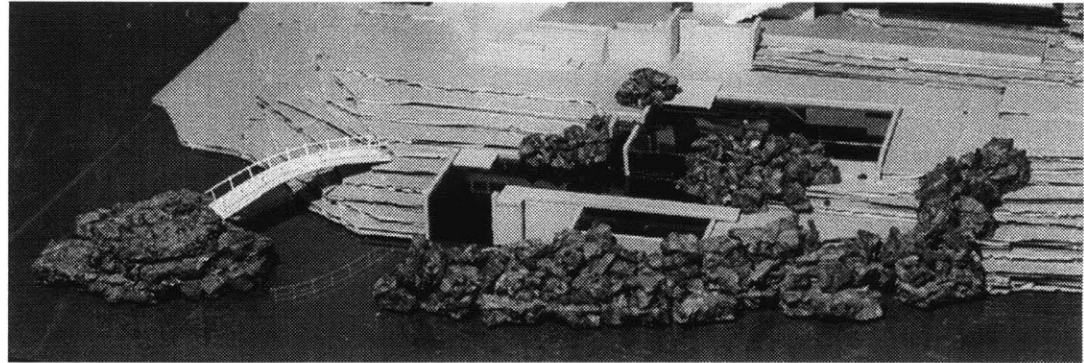


fig. 62.1 Cascading pools with island.

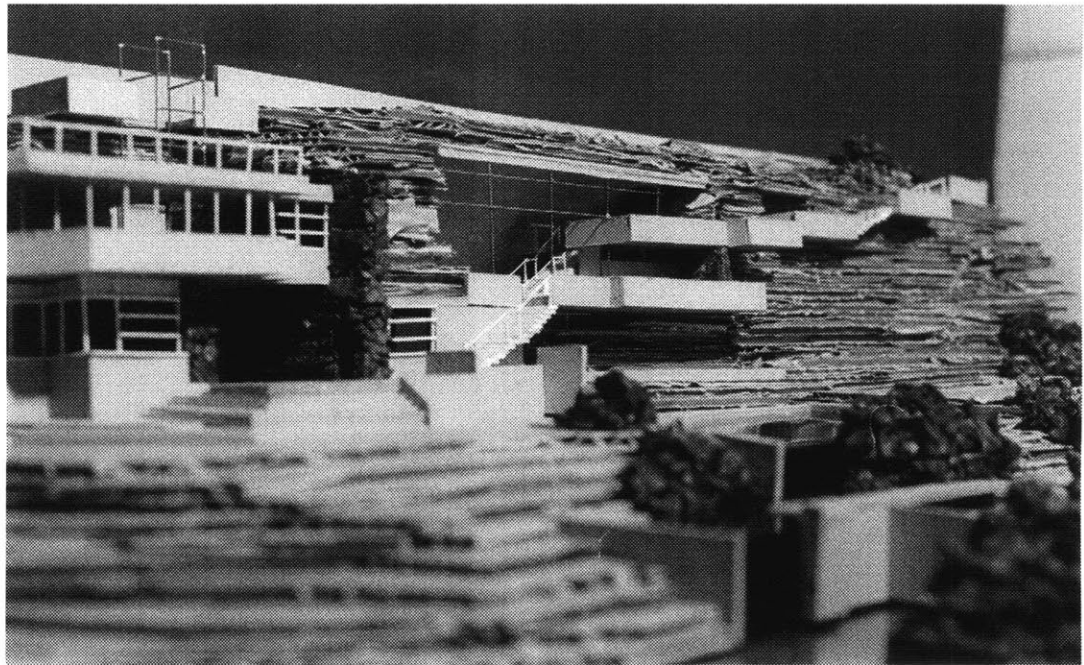


fig. 62.2 View from the island back up to the cliff.



fig. 63.1 View from the island back into the cove.

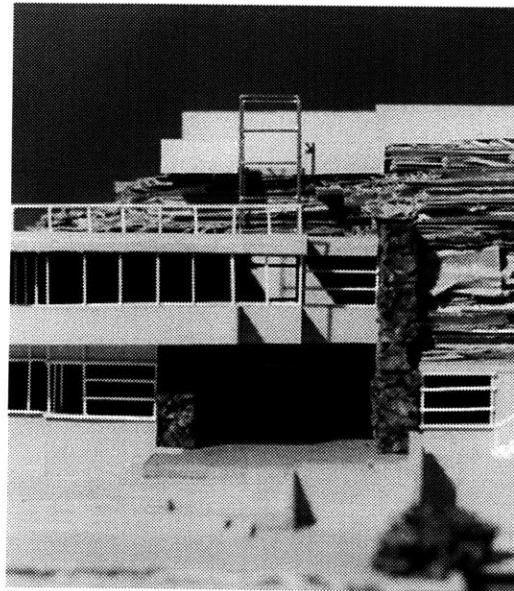
CONTRAST OF MATERIALS

Walls, floors, and roofs all define space, whether they are built with natural, untouched topography or with man-made forms. When building in the landscape, there is a site enhancing contrast between the “untouched” earth and the “built” forms. It is the recognition of differences that provide the beauty between two materials. For example, the project uses concrete walls to penetrate into the cliff and retain the earth. It is at these points where the built form is tied to the landscape.

In addition, there is a contrast among the built forms, whether the material is indigenous or foreign to the site. The project uses glass panes to provide enclosure, but also to let in light. The glass intersects with stone walls built from the excavated cliff so that there is a dichotomy between the two.

fig. 64.1 A contrast in materials - untouched topography, built stone walls, concrete slabs, and glass windows (left).

fig. 64.2 Texture of stone shrine (right).



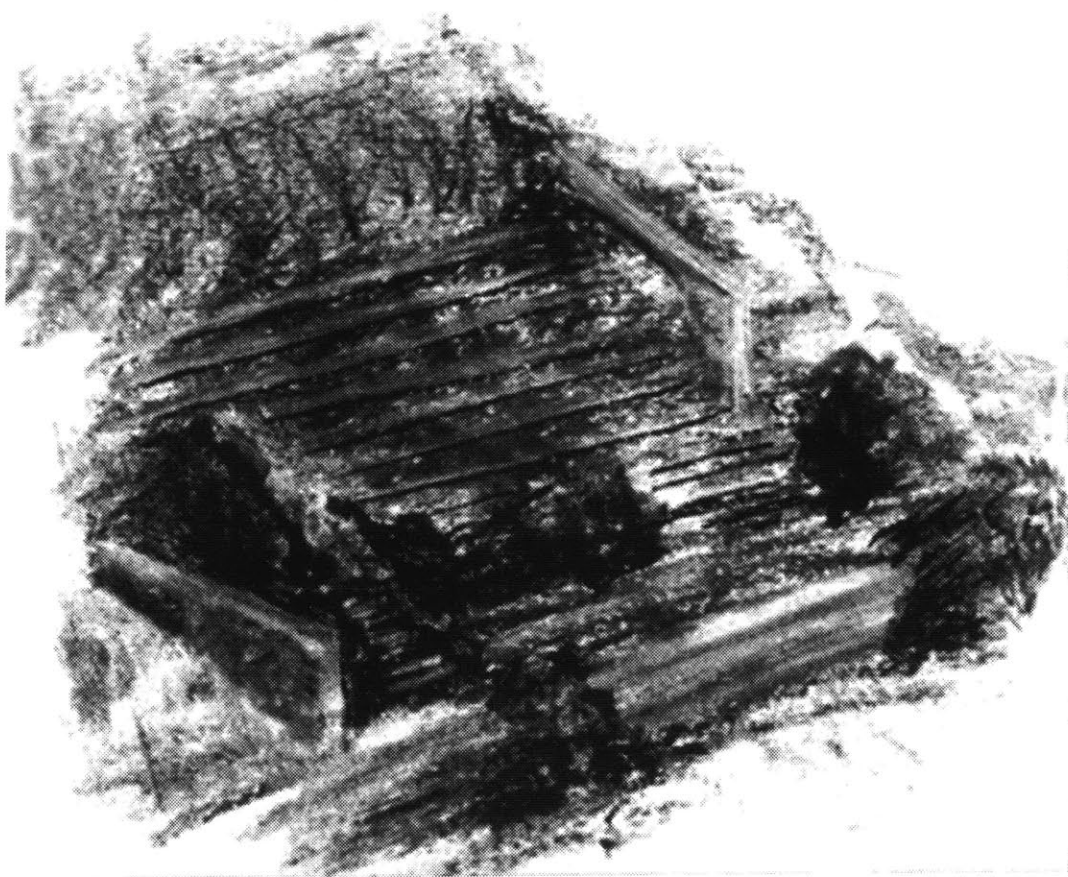


fig. 65.1 Stairs carved into the cliff face adjacent to concrete retaining walls.

LIGHT AND SHADOW

As people move into and out of the cliff, they also move into and out of the sunlight. Shadowed tunnels in the cliff exit to the bright outdoors. The opposite occurs at night as people move from the darkness into the lighted areas of the cliff.

Furthermore, the manipulation of light and shadow provides a constant rhythm through the repetition of smaller elements like trellises and the proportions of window openings to solid walls.



fig. 66.1 Outdoor cafe at night.

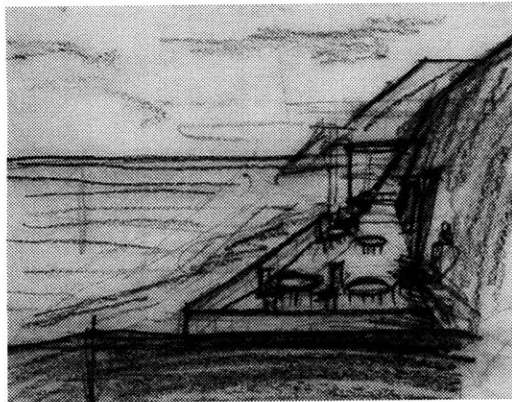
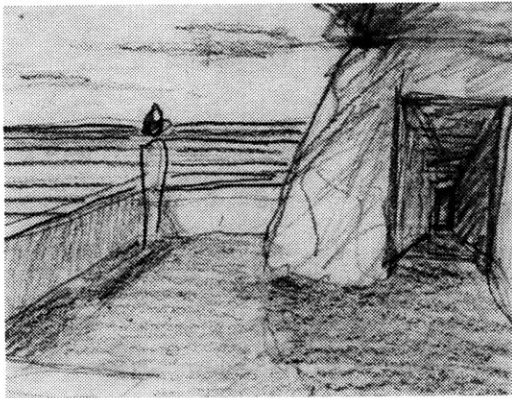


fig. 67.1 Shadowed tunnels adjacent to sunny terraces (top).

fig. 67.2 View of extruded terraces and carved forms in the cliff (bottom).

Architectural Precedents

"It is a great challenge to plant a construction in a protected area landscape where the experience of pure nature is to fill your mind. You may ask - the architect and the landscape...how to observe a terrain in order to find a position of attack?"

Svere Fehn, *The Poetry of the Straight Line*.¹⁵

Frank Lloyd Wright

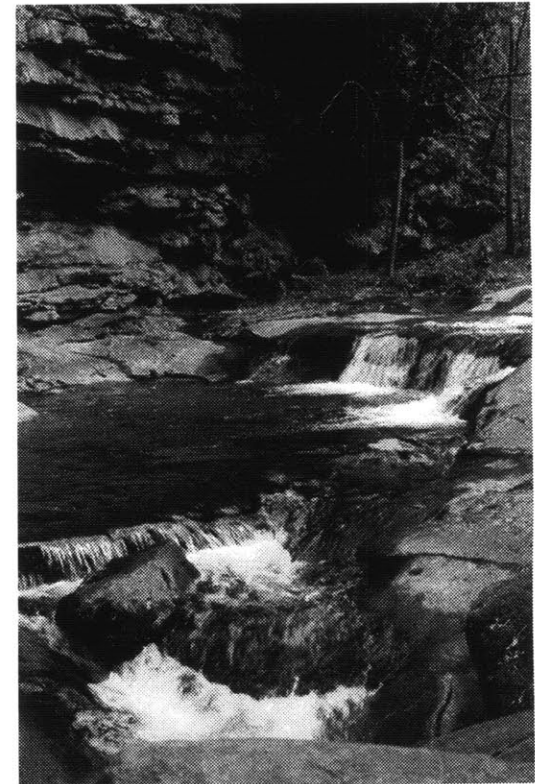
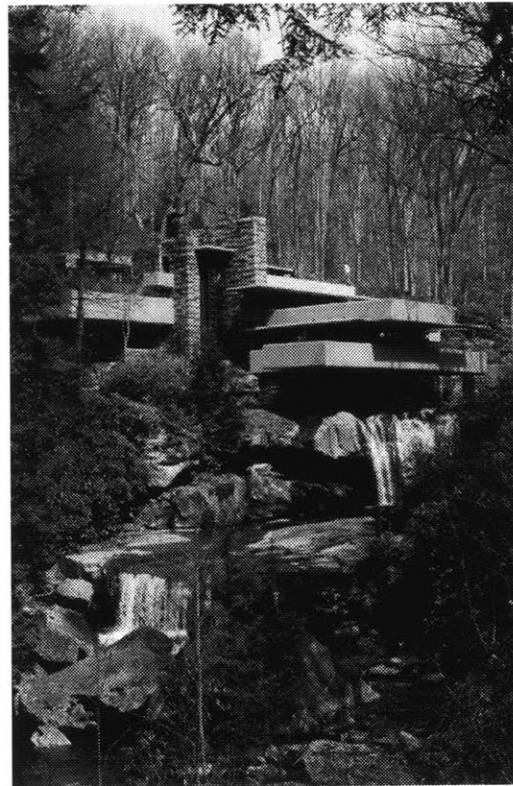
Fallingwater

Bear Run, Pennsylvania,

I was amazed at this house when I went out to see it. Most of what I noticed was the relationship of built form to the landscape and the experience of place. The juxtaposition of the textures of the stone walls against the glass windows was a beautiful detail. I also enjoyed the way the sounds of the waterfall could be heard in the bedrooms through small windows. Moving out onto balconies and being above the landscape, or climbing down a suspended staircase to the water enhanced the experience of the landscape.

fig. 70.1 Fallingwater (left).

fig. 70.2 The landscape around the house (right).



Lawrence Halprin

Halprin's thoughts and drawings on understanding the ecological origins of natural forms and the forces acting upon them were inspirational. One of the notes in his sketchbook read, "how ocean meets the land...the interaction between wave & tidal actions & the resulting shapes of the cliffs..."

Furthermore, Halprin used these discoveries as a foundation for his designs. He realized that an experience in nature can be captured in man-made environments. What he called "experiential equivalency" was a way of designing in order to provide experiences that went beyond visual design and searched for basic needs.¹⁶



fig. 71.1 Halprin's sketch of rock formations.

Sverre Fehn

Art Gallery at Verdens Ende (The Word's End), Project
Tjøme, 1988

This project was another great example of how built-form is incorporated with the topography. The sides of the crevice becomes the walls of the gallery.

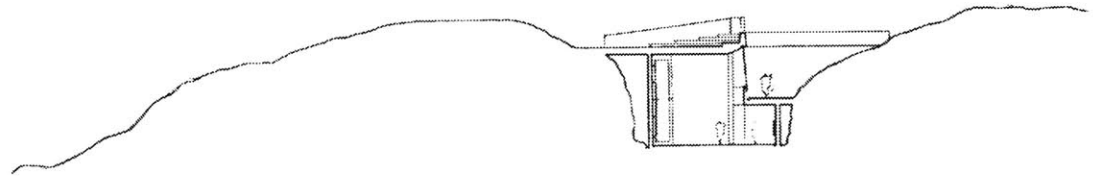


fig. 70.1 Section through project (top).

fig. 70.2 The proposed landscape (bottom).

Alvaro Siza

Leça Swimming Pool

Matosinhos, Portugal, 1961 - 1966

A third example of building in a natural landscape. The pools are constructed with both the natural topography and man-made concrete walls.

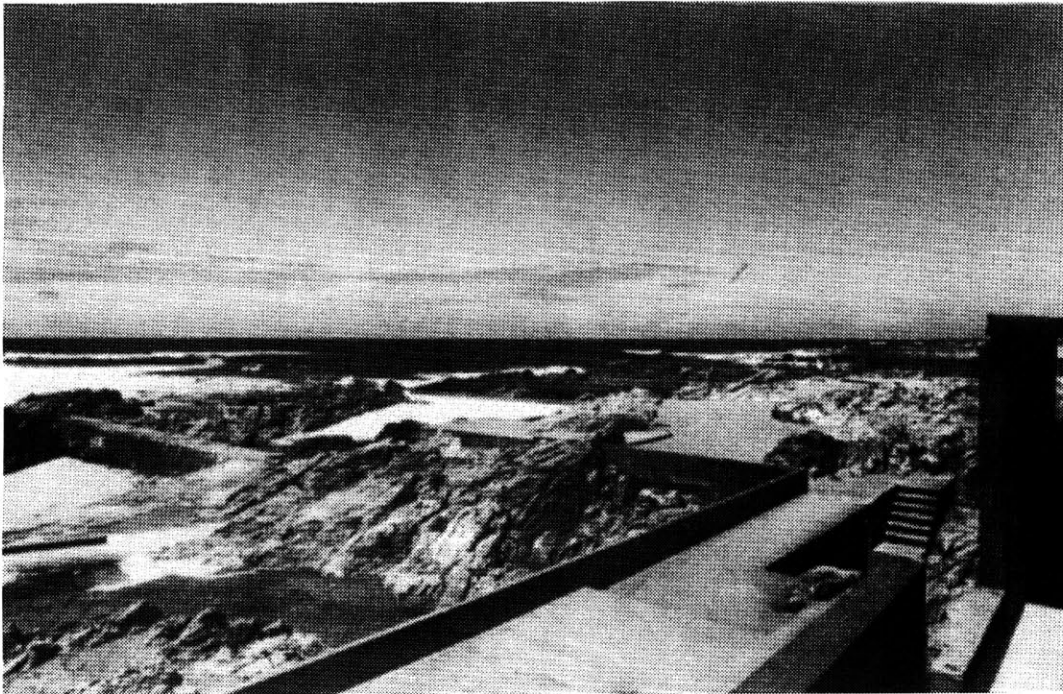
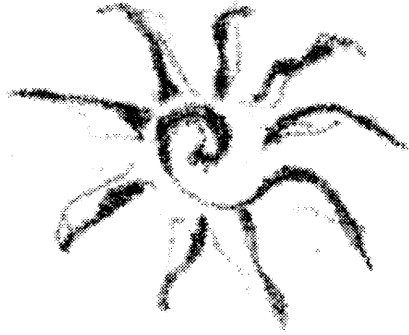


fig. 73.1 View over pools towards the horizon.



Where it all ended...

"The continuity with which the forces of nature act on a given site must be matched by a like continuity of human effort to maintain what has been achieved."

N.J. Habraken, *Transformations of the Site*¹⁷

Every design begins with what is there. The site continues to change over time due to the powers of people and nature. Both alter the landscape through the processes of adding, subtracting, and moving elements.

The architect must understand the site and its transformations, in order to design with the basic strategies of "touching" a landscape with built architectural form. In the end, building in the landscape can enhance a place through the intensification of use and the beauty of its form.

Endnotes

- 1 The Soul of the Ancients, Videocassette. Joseph Cambell, 1989, vol.1.
- 2 Messervy, The Inward Garden: Creating A Place of Beauty and Meaning, Little, Brown and Co., p. 25-37.
- 3 Decker, Volcanoes, W.H. Freeman and Co., p. 70.
- 4 Bullard, Volcanoes of the Earth, University of Texas Press, pp. 256 - 260.
- 5 Bullard, p. 256 - 260.
- 6 Armstrong, Atlas of Hawaii, University of Hawaii Press, p. 59.
- 7 DeHarpporte, West and Southwest Wind Atlas, Van Nostrand Reinhold Co., p. 16.
- 8 Francis, Volcanoes: A Planetary Perspective, Clarendon Press, pp. 340 - 345.
- 9 Belt Collins & Associates, Koko Head Park Master Plan: Final Plan, pp. 5 - 7.
- 10 Belt Collins & Associates, pp. 5 - 7.
- 11 Ackerman, A Natural History of the Senses, Random House, p. iii.
- 12 Messervy, p. 26.

- 13 Habraken, Transformations of the Site, Awater Press, p. 11.
- 14 Wurman, What Will Be Has Always Been: The Words of Louis I. Kahn, Shambhala Publications, Inc., p. 135.
- 15 Fehn, Sverre Fehn: The Poetry of the Straight Line, Museum of Finnish Architecture, p. 29.
- 16 Halprin, Sketchbooks of Lawrence Halprin, Process Architecture Co., Ltd., p. 20.
- 17 Habraken, p. 60.

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- fig. 3.1* Sedam, Hawaii, p. 109.
- fig. 9.1* Photo by Carl Kameoka.
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- fig. 12.2* World, Map, World Rand McNally Cosmopolitan Series.
- fig. 13.1* Bullard, Volcanoes of the Earth, p.261.
- fig. 14..1* Oahu, Hawaii, Map, U.S. Geological Survey, 1971.
- fig. 15.1* Sedam, Hawaii, p. 82.
- fig. 16.1* Sedam, Hawaii, p. 109.
- fig. 18..1* Koko Head, Map, U.S. Geological Survey, 1983.
- fig. 19..1* Photo courtesy of R.M. Towill Corporation, Honolulu, Hawaii.
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- fig. 30.2* From Here to Eternity, Film, Columbia Pictures Corp., 1953.

- fig. 30.3* From Here to Eternity, Film, Columbia Pictures Corp., 1953.
- fig. 69.1* Halprin, Sketchbooks of Lawrence Halprin, p. 66.
- fig. 70.1* Fehn, The Poetry of the Straight Line, p. 28.
- fig. 71.1* Mendes, Portogallo: Architettura, gli ultimi vent'anni, p. 104.

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